THE IRON AGE

THE NATIONAL METALWORKING WEEKLY October 5, 1950

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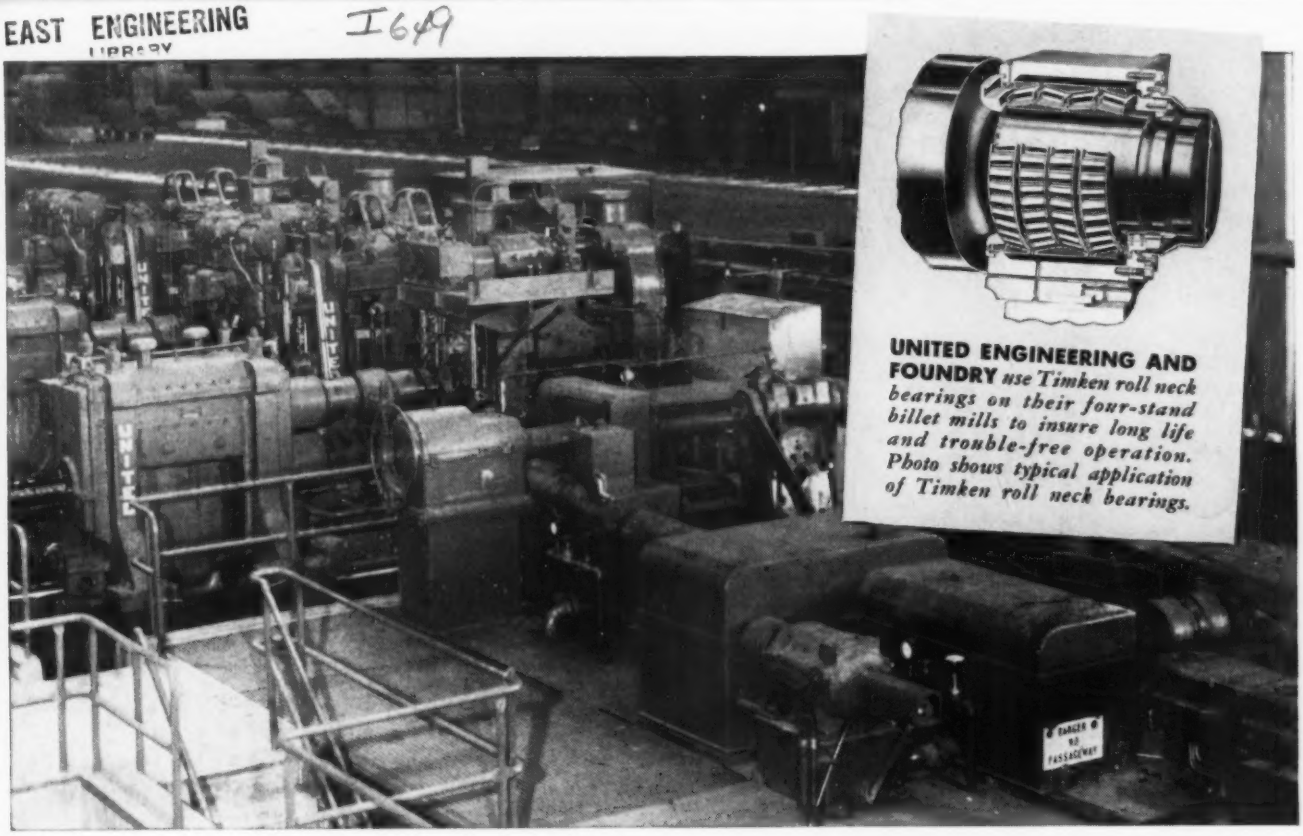

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How TIMKEN® bearings help make short work of long-run production

THE ROLLS of this United four-stand billet mill are mounted on Timken® roll neck bearings to insure maximum rolling speeds and continuous, long-run operation with minimum time-out for maintenance. Timken bearings virtually eliminate friction, making higher rolling speeds possible.

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Drives

Cold-Formed Shapes

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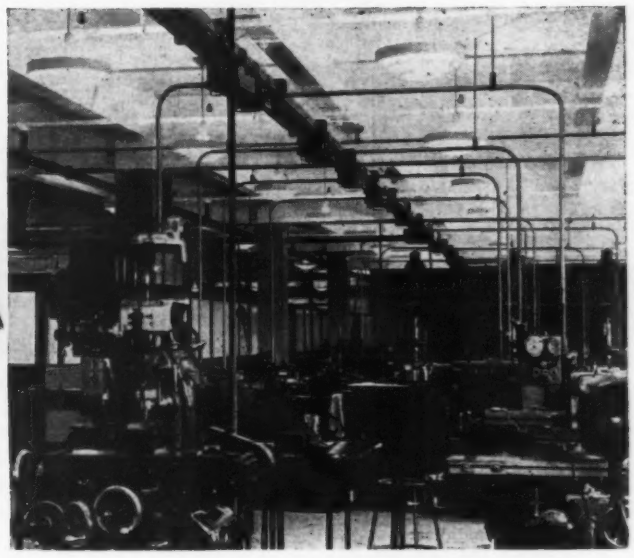

This cold-formed shape, a 7-in. channel with 1-in. legs, is used as a housing member by Trumbull Electric, a manufacturer of plug-in systems for the distribution of industrial light and power. We make it on brakes, using 16-gage steel, and furnish it to the customer in long lengths.

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THE IRON AGE

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October 5, 1950 • • • Vol. 166, No. 14

Special Article

New machinability determination method uses a graphical plot of microscopic tool wear measurements. It is accurate and faster than conventional tests.—p. 79.

Issue Highlights

Packard Motors precision bores six planetary gear spindle holes in a cage scarcely 6 in. in diameter. Indexing error between any two holes is held to 0.001 in.—p. 88.

Metal finishing is changing from an art to a science. Conveyerized handling through controlled atmospheres and automatic cycles produces consistently finished parts.—p. 90.

Ductile vanadium, 99.8 pct pure, is now available. It can be rolled at ordinary temperatures. Cold reductions up to 85 pct have been made without annealing.—p. 95.

Steel salesmen and their customers who think the steel market has advanced past the hectic stage will see things further aggravated by the spread of bureaucracy in Washington—p. 101.

The Assn. of Iron and Steel Engineers met in Cleveland last week where from 10,000 to 12,000 persons attended. The Lorig self-centering roll was on the exhibit list and unofficial conversations dwelt on indecision of the government.—p. 103.

The White House is this week studying administration of 5-year accelerated depreciation to apply to businesses engaged directly or indirectly in defense work.—p. 105.

Over the buzz of a small but volatile scrap market this week a careful ear could detect the bellow of a distant bull. —p. 106.

Coming Next Week

IRON AGE Metal Show Issue will include articles on the strength of vanadium rimmed steel, current multi-million dollar metallurgical research, a discussion of advantages of argon v. helium for inert gas shielded welding and others.

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Indexed in the Industrial Arts Index and the Engineering Index. Published every Thursday by the *CHILTON CO. (INC.)*, Chestnut and 56th Sts., Philadelphia 39, Pa. Entered as second class matter Nov. 8, 1932, at the Post Office at Philadelphia under act of March 3, 1879. $8 yearly in United States, its territories and Canada; other Western Hemisphere Countries $15; other Foreign Countries $25 per year. Single Copies 35¢. Annual Review Number, $2.00.

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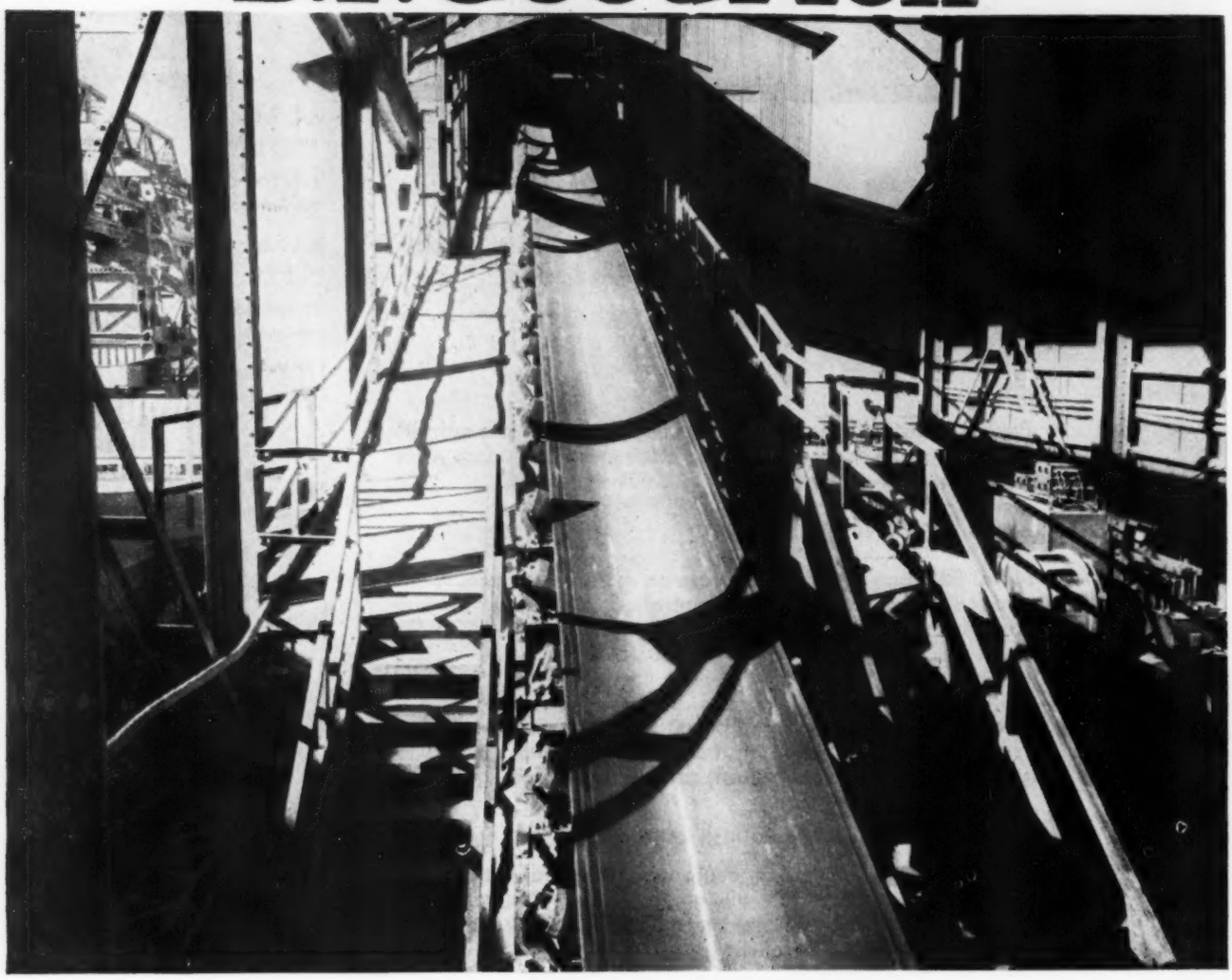

60 million tons in 11 years B. F. Goodrich belt is still in service

IT HAS cost less than $125 for belt repairs to keep that beltroad in service for 48,000 hours, averaging 12 hours a day, 7 days a week, for 11 years, handling well over 60 million tons of copper ore. It's at the Chile Exploration Company in Chuquicamata, Chile.

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Conveyor Belts BY

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RUBBER FOR INDUSTRY

Editorial

INDUSTRY VIEWPOINTS

Beware of the Lullaby

IT has taken a long time to awaken the people to the sinister and dangerous character of the Communists. We now know that we face in Russia a relentless enemy. One which will give no quarter. One which will laugh with glee if we have a depression and one which will laugh its head off if we have too much inflation. Either way we are in for trouble.

That is unless we quickly arm to the teeth, prepare the country and contain the commies so that they will be afraid to start a war. Maybe we can do this. Maybe we can't.

We have the people, the industrialists and the machinery to do what is necessary. But do we have the leaders? Certainly the show in Washington looks a whole lot like the ancient Roman circus where everyone was promised everything at the same time with no pain to anyone.

Now that the United Nations forces are winning successes in Korea there will be many who might want to let down. There will be the commies who will infest our people with sly reports that we don't need to arm now. Or that the danger is over. Or that Russia only wants peace. The bad part about it—no, the pathetic and horrible thing about it is that some of our best people will fall for that line.

They will fall for that line if those charged with making this country strong start to let up on the job. The Administration for the past 3 months has muddled along as if we had years to prepare. Committees, committees, hot air, puff balls and complete inaction except the working of the jaws.

If on top of this we are to have those who think that a victory in Korea means we can settle back and enjoy life then it is high time everyone who knows different takes to the soap box and yells his lungs out that it isn't so.

One would think it was all a dream; that we had a nightmare and that upon wakening the danger was over. Well it isn't anything of the kind. Those who have been warning us about the future are heartsick. They are amazed and astounded in what they see in Washington today.

They are afraid that the Korean successes—with the aid of the fifth columnists, the fellow travelers, the "peace" loving stooges of Russia and the mediocrity in the Administration—will put us back where we were. Then will the commies laugh, howl and jump up and down. That's just what they want.

Beware of the lullaby. Beware of the soothing syrup that might put us to sleep at a time when we need to be awake 24 hours a day. The commies thrive on that stuff.

Tom C. Campbell

Editor

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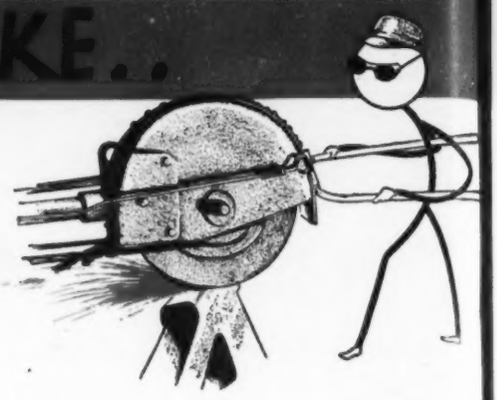

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NEWSFRONT

NEWS, METHODS AND PRODUCT FORECAST

► A new way of making thin walled seamless tubing is now in production. The process is a cold--not a hot operation. Wall thicknesses of 0.005 in. can be produced in lengths up to 30 ft, with extremely close tolerances. Details can not be disclosed now.

► Operating speeds on a new induction welder producing conduit have reached 195 ft per min. The machine is not in production use yet; there are still some problems to be ironed out. One of them is development of a cutoff device.

► The Army isn't saying how many tanks it plans to order under its $500 million tank program but hints the number is in excess of current actual needs. The figure is probably under 2500, though some observers feel we need 25,000.

► During the coming year the price of titanium sponge (from which titanium ingots are made) may come down to between $1.50 and $2.00 per lb. Price now is $5.00.

► Initial shipments of German scrap to U. S. Steel plants were of excellent quality; later shipments were not so good. But there is plenty more to come and the company is keeping its fingers crossed. Overseas strikes and other troubles are slowing deliveries.

From another source No. 1 heavy melting scrap from Europe was offered at $38.20 per gross ton c.i.f. New York.

► Wired television, used for some time to observe and control a continuous steel casting process was last week installed in a Western steel mill to simplify loading of slabs into furnaces. Another mill is planning to put in a similar unit and transfer three men from the hot spot over slab heating furnaces.

► Nonferrous metal prices continue to soar. Tapping a new source, one foundry has paid $1.00 per lb for nickel (regular price 48¢). Another company paid 30¢ a lb (against less than 25¢ in regular channels) for immediate delivery of electrolytic copper.

► Central Pennsylvania and West Virginia coal fields will profit from the coke plant to be built at U. S. Steel's new Eastern mill (Fairless Works). Coal is expected to come from these fields rather than from the corporation's captive pits in the Pittsburgh district.

► Industrialists close to military procurement were of the opinion last week that major arms procurement programs would not be cut back by early success in Korea. But statements by some Washington sources to the contrary now have some confused on the overall program. The major programs will go through.

► Kaiser-Frazer engineers have reduced the number of major stampings from 140 in a conventional car to 80 stampings in the Henry J. At 2300 lb, the new K-F car marks a definite step in reducing weight and number of parts.

► Direct measurement of insulation resistance or "grounds" in any normally ungrounded electrical system--whether nonenergized or energized with ac or dc--is possible with instruments developed by the Naval Research Laboratory, Anacostia, D. C.

► The scramble for steel by the automobile industry is at a postwar peak. The combined impact of high production schedules, the growing arms program and the loss of tonnage at mills has sent auto parts suppliers to the automakers with more frantic appeals for help than they have ever heard.

When detecting temperature by radiation method . . .

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Murray Expected to Reject 6¢

Rising Costs Press Steel Prices

Gray Market Operator Caught

The Iron Age SUMMARY

IRON AND STEEL INDUSTRY TRENDS

EVEN if it finally means another fact-finding board in steel, Phil Murray will press for a substantial raise in steel wages. He is expected to turn down a 5¢ or 6¢ offer that has been set as the maximum to which some large steel firms will go without raising steel prices. This week it looked certain that the steel industry faced a wage increase and a price increase.

The wage negotiations will be entered into with both sides having their eyes cocked on Washington. Steel firms already have absorbed heavy cost increases which have not yet shown up in earning reports. There are: Aluminum, copper, lead, zinc, scrap, pig iron, paper, alloys and other items which make up the steel bill. If labor wins a husky increase (the last one was in 1948) steel prices might rise as much as $6 to $8 a ton. Even the Wage Stabilization Board will recognize labor and material increases as demanding a compensating price rise.

Need Funds for Expansion

But there is another compelling factor to keep steel firms' earnings up. Only from them can the industry get the major part of funds needed to expand by almost 10 million tons by the end of 1952. Financing will not take all the load and if earnings are not good (in today's dollars) investors will not invest.

While steel faces wage and price pressure, demand for its products is still at high tide. Nor is there any sign of a low tide. Despite some press reports and alleged expert views to the contrary, steel is in for a hectic period unsurpassed since 1940.

Priorities are now being given all defense orders. But these priorities will not clearly tell which order comes first. Large scale programs such as munitions, freight cars, shipbuilding repairs and other programs big enough to continue for some time will be aided and pushed by a task force of steel experts. But thousands of smaller —one or two time—orders will get priorities which must be honored by steel firms. There is to be no check on how such orders are placed. One steel firm will not know unless the buyer tells him how much of the order is being filled by others.

Appointment of a steel division head in the NPA will help some. But this is a far cry from the modified controlled materials plan which will emerge when the present one falls on its face from confusion.

Flat-Rolled Needs May Rise

It will be the same old story told in 1940 and 1941—more tickets issued than there are seats for a given performance. Some steel people privately say that flat-rolled percentage for defense and indirect defense may reach 40 to 45 pct of total by next May or June. Statements from Washington belittling the effect of defense on steel production can be accepted with several pinches of political salt.

Steel companies are not fooling about stamping out the gray market. One Pittsburgh steel consumer has been caught flatfooted. His steel has been cut off and he will probably have to dispose of his plant. Trouble came when a workman forgot to remove mill identification marks on part of a shipment of 200 tons of sheets. They were resold in New York at $300 a ton. Mill price was $110. Profit, over $35,000.

More Prices Advance

Price changes in steel during the past week included advances in flat-rolled products by Granite City Steel Co. and Sharon Steel Corp. At least two other firms have increased certain extra charges on steel. Other price advances of the past week include tungsten, molybdenum, cast iron pipe and some coke prices.

Steel ingot operations for the week are scheduled at 101 pct of rated capacity, up half a point from last week. Steelmaking scrap prices are generally holding but a strong spurt in foundry business has forced cast iron scrap higher in most markets.

(Nonferrous summary, p. 126)

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Dear Editor

Letters from Readers

Are Bearings For USSR Made on ECA Machines?

Sir:

I was very much interested in the two articles on p. 121 of the Sept. 7 issue of THE IRON AGE. Mr. Tell Berna charged that American money is being used to help build machine tools which are being shipped behind the Iron Curtain. The ECA did not clearly answer Mr. Berna's charges but equivocated and in essence stated that the machine tools that are being shipped behind the Iron Curtain are not important as strategic items.

From time to time our Government authorities tell us that the war we are in involves all that we make and all that we use. The next minute they try to separate the sheep from the goats and say that a certain type of drill press is useful for making munitions and another is only good for making kiddy cars. We know that machine tools are used to produce the sinews of war. This fact cannot be glossed over by any use of semantics.

I wish you would ask ECA authorities if ball and roller bearings are being shipped from Italy and Germany to Russia and to Iron Curtain countries. I wish you would ask them if these bearings are being produced on machinery bought with ECA funds. I cannot get an answer to this question; perhaps you can.

W. E. UMSTATTD
President
Timken Roller Bearing Co.
Canton, Ohio

ECA says it has no way of knowing exactly whether or not roller bearings are being exported from Italy and Germany to Russia and its satellites. We gather from ECA that small quantities are apparently being exported from Italy.

Production in Germany is held to domestic needs only by the Joint Allied Command, but we can assume that there is some smuggling. ECA further says there is no way of knowing whether these bearings are being produced on ECA financed machinery. It adds that actual shipments of bearings are not ECA financed. ECA also said that there is no embargo on shipments from the U. S., but that one is being worked up now.—Ed.

Old Catalogs Wanted

Sir:

I am a used machinery dealer soliciting all enquiries and usually locating in yours and other trade magazines. This year, we were flooded out, and I lost about a 15-year collection of catalogs, directories, and other trade books. I used these in outlining full specifications of various machines we negotiated. Thus, I am severely handicapped in my business today. I would welcome all such publications, new or old—the older the better—and pay freight charges. Can you do anything for me on this?

S. H. LEVENTHAL
S. H. Leventhal & Co.
Winnipeg, Canada

Mr. Leventhal's mailing address is P. O. Box 487, Winnipeg, in case any readers or machinery firms should have literature of the type wanted.—Ed.

Foremen-Mediators

Sir:

I particularly enjoyed reading the editorial in the Sept. 7 issue entitled, "The Forgotten Man Is Remembered."

We discovered this some months ago and immediately inaugurated bimonthly meetings in which our shop management had a joint meeting with the foremen in order to outline company policies, labor problems, etc. We have found these meetings to be very beneficial and many labor problems which formerly reached the grievance stage are now satisfactorily handled by the foremen. I think, because of this, the foremen in our plant command a greater respect from the workmen and the foremen, themselves, now feel that they are a vital part of management.

H. G. COFFEY
Vice-President
Aetna-Standard Engineering Co.
Youngstown

Who Makes High Phos Fe?

Sir:

As a subscriber to THE IRON AGE for some years, we are wondering whether you could help us in locating some one in this country who makes the following analysis high phosphorous iron: Combined carbon 1.08, graphitic carbon 2.00, manganese 0.42, sulphur 0.076, phosphorous 1.44, silicon 2.32, nickel trace, chromium 0.06, molybdenum trace.

This analysis is established from a casting received from Europe and is necessary for the successful production of a certain class of highly specialized user here in New York. It seems evident that the high phosphor content has something to do with the open grained structure of the iron, which is desirable in this case. A good-sized yearly tonnage could be promised if a successful manufacturer could be located. Castings must be without pin holes or foundry defects.

E. LOUGH
Lough Bros.
New York

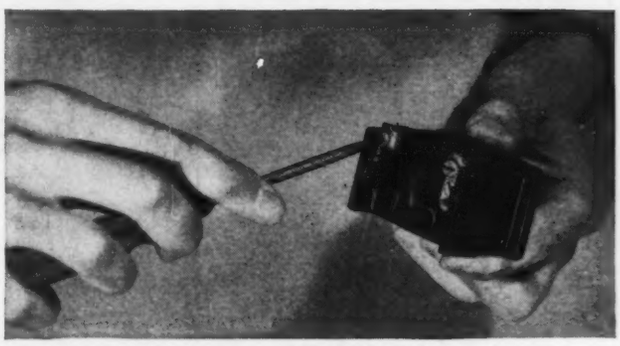
The so-called Southern irons run from 0.7 to 0.9 pct P. These represent the highest domestic phosphorous contents. The phosphorous content required is high, even for foreign iron. Any readers having information on this may contact Mr. Lough at 90 West St., New York 6.—Ed.

G-E starters last longer!

PROVES IT FOR HIMSELF WITH THE SCREWDRIVER TEST

Mr. Pyne: *"Looks different. What's it got?"*

1 That coil—we call it the "strong box" magnet coil—lasts two to five times longer than a conventional coil. Suppose the electrician's screwdriver slips and hits the coil. The windings can't be damaged because they're firmly locked in a block of molded plastic.



Mr. Pyne: *"Will these terminals work loose?"*

2 Not a chance! They're permanently anchored in the coil enclosure so they can't loosen, even after years of operation. You'll notice they're on the front of the coil, too. That makes for easier servicing.

Mr. Pyne: *"This magnet moves smoothly enough."*

3 Yes—and you can be sure it will do just that even after it's been in service for years. That's because the plastic coil block is made with a permanent "molded in" lubricant. No metal-to-metal friction, no bearings to wear!

Mr. Pyne: *"Contacts that burn easily seem to be a major headache. How about these?"*

4 Under average conditions you can count on these contact tips to stand up even on the toughest "start-stop" service. They're made of fine silver and there's little chance of their welding together thanks to a high initial tip pressure. And the arc hood keeps each tip protected in its own chamber.

Mr. Pyne: *"What about corrosion?"*

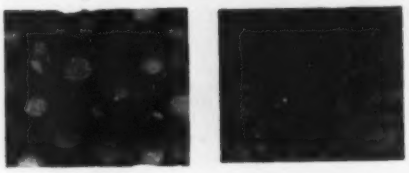
5 No problem at all! All steel parts are zinc plated. The arc chutes are impregnated with a special wax to resist moisture absorption. Finally, the case is coated with a special corrosion-resisting material and painted an attractive gray.

WHY DON'T YOU BUY ONE AND COMPARE

Make the screwdriver test yourself—and see why the new G-E magnetic motor starter lasts longer than any other you can buy. Your G-E representative or distributor salesman can supply you with this new starter *from stock* in NEMA sizes 0, 1, 2, and 3 for a-c motors up to 50 hp. For a complete description, write for the "tell all" bulletin, GEA-5153. *Section 730-11, Apparatus Dept., General Electric Company, Schenectady 5, N.Y.*

Here's Why
TRU-STEEL SHOT
Costs Less to Use

LIFE COMPARISON
TRU-STEEL vs. CHILLED IRON SHOT
Magnified 10X



TRU-STEEL
After 1500 Passes

CHILLED IRON
After 50 Passes

Users Find TRU-STEEL Has 5 Important Advantages

- LASTS MANY TIMES LONGER—LESS SHOT IS USED

  Gray Forgings and Stamping, Ltd.: "We find Tru-Steel Shot lasts from 5 to 6 times as long as ordinary shot."
- REDUCES CLEANING COSTS PER TON

  A Detroit Manufacturer: "Just figuring the savings in abrasive and parts alone, we showed a savings of 30% in the cost per ton of parts cleaned compared to our previous costs with chilled iron shot."
- SAVES STORAGE AND TRANSPORTATION COSTS

  A Prominent User: "In general Tru-Steel costs half as much as ordinary shot, cuts down on maintenance and costly parts with less handling and storage."
- INCREASES LIFE OF MACHINE PARTS

  A Midwest Manufacturer: "Another big advantage we find is the longer life of the machine itself. We saved 63% in the cost of replacement parts, not counting the time saved by our maintenance men in not having to replace parts often."
- REDUCES MACHINE MAINTENANCE COSTS

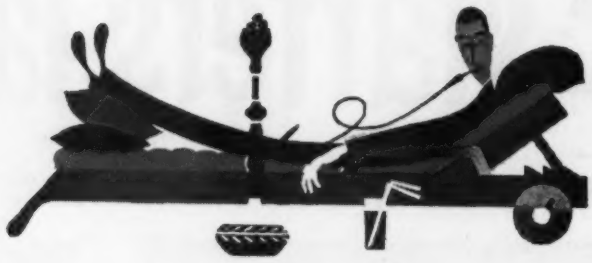
  A steel foundry reports the use of Tru-Steel Shot resulted in a savings of 73% on wearables, 63% on abrasive consumption, and 80% on maintenance labor.

Write for Bulletin No. 59

DISTRIBUTED BY

American
WHEELABRATOR & EQUIPMENT CORP.
510 S. Byrkit Street, Mishawaka 3, Indiana

Mfd. by: Steel Shot Producers, Inc.



Fatigue Cracks

By CHARLES T. POST

Private Eye

At the Iron and Steel Engineers' show in Cleveland last week we saw a device that casts a long, ominous shadow into the future of all who toil.

Diamond Power Specialty Corp. is attempting to interest the top brass of industry in a version of television that could shatter completely the lovely luxury of lolling on company time. The television camera is located in the shop, focused directly on the machine and the man who runs it. The scene is transmitted directly to the front office, be it a block or 50 miles away, for the boss to see exactly what goes on.

The manufacturer of this outfit discreetly suggests that it can be used for observing operations not susceptible to personal watching, such as automatic machining of explosives, but we predict that it may give practical peonage the greatest push since the invention of the whiplash.

We can picture the big boss sunk deep in his overstuffed chair puffing his Corona Corona. He is surrounded by television sets, banked three deep on four sides, watching the sweating toilers in the farthermost reaches of his nationwide string of shops. Lord help the lad in Walla Walla who stops to scratch his back. Or, for that matter, the gal in Galveston who tries to take advantage of the time-honored privilege of gabbing in the powder room, because there'll probably be a television camera there, too.

The Cock's Crow

From our standpoint, we had barely touched our head to the pillow in the Hotel Cleveland when the raucous telephone bell disturbed the peace.

"Your 7:30 call, sir," soothed the saccharine-voiced operator.

We thanked her insincerely, hung up, and pulled the blankets up over our head. Five minutes later came the phone bell again.

"Just wanted to be sure you were up, sir," said the switchboard witch.

This time we did a thorough job of pulling the phone cord out at the roots.

When we're in Cleveland again we'll either try to get to bed before dawn or else stop at the Statler.

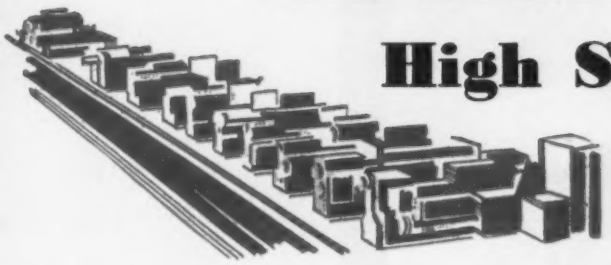
Prize Package

You should advise your unpacking department to look carefully when it unpacks stud welders shipped from Nelson Studwelding Div. of Morton Gregory Corp. The new vice-president and manager of construction industry sales is W. J. Kane, formerly sales manager of the Cracker Jack Co. We assume that from now on there'll be a special prize tucked in the crate with each and every welder.

Puzzler

Not since the time our suspenders snapped in front of the beauty parlor have we been as embarrassed as we are not to give you the answer to last week's puzzle. You will recall that one of the loyalest of our 14 loyal readers wanted to know how long a board could be laid diagonally across the floor of a 12 x 14 room. Frankly, we can't find out because none of our rooms happen to be 12 x 14. You'll just have to wait until the carpenters make the necessary alterations or someone else sends in the answer.

MACHINE TOOL High Spots



Sales Inquiries and Production

By W. A. LLOYD

Delivery Date Ruckus—A battle for delivery was shaping up in the machine tool industry this week as defense contractors were needling for preference and regular customers were resisting any effort to push them back on the schedules.

Defense contractors will probably get the nod, but a certain amount of diplomacy will be required, in view of the apparent end of war in Korea.

Meanwhile, the industry is having plenty of trouble getting steel. Some companies have expediters out, which is definitely not an economical method of steel procurement. The need is for sheets, plate and cold-rolled bars. But the industry's postwar steel requirements, until about 3 months ago, have been so low that their historical quota falls far short of the requirements of present production. The shortage is such that a few companies are facing the possibility of temporary lay-offs.

Mobilization Meeting—In Toronto, representatives of all branches of the machine tool industry will meet at the Royal York Hotel there, Oct. 10, to review mobilization plans of the machine tool industry in light of developments in Korea and elsewhere. Chairman of the group is Herbert L. Tigges, vice-president, Baker Bros. Co., Toledo, and president of the ASTE.

The group is known as the Joint Industry Mobilization Group and is composed of industry representatives, each of whom has been given a specific problem on which he will specialize. Originally, the group was an outgrowth of preparedness activities of the Manufacturing Production Div. of the National Security Resources Board. It has been meeting independently as an industry mobilization group to insure maximum preparedness of the machine tool industry at all times. In case of a national emergency, it is likely that it would be incorporated in the NPA.

Speakers Listed — Tentative agenda of the meeting includes talks by Mr. Tigges, Brig. Gen. S. E. Reimel (ret), David Ayr, president National Machine Tool Builders Association and president Hendey Machine Co., Torrington, Conn., and others, including a representative of the Canadian machine tool industry.

Group members who will participate with short talks include: E. C. Adams, Lincoln Lubricating Systems, Inc., New York; Edgar F. Seifreat, president, Seifreat-Elstad Machinery Co., Dayton; Victor Gottsman, Victor Gottsman Machinery Co., Detroit, and C. E. Needy, Landis Tool Co., Waynesboro, Pa.

British Branch—In Boston, John J. Prindville, Jr., president of LaPointe Machine Tool Co., Hudson, Mass., announced opening of a new and enlarged plant of LaPointe Machine Tool Co., Ltd., LaPointe's British affiliate.

The new plant, which replaces the former manufacturing facilities at nearby Edgware, is said to be the largest and most up-to-date in Europe devoted exclusively to the manufacture of broaches and broaching machines.

The new building contains 40,000 sq ft of manufacturing space and has several advanced architectural features, including a complete absence of columns or other obstructions, fluorescent strip lighting, power cables concealed in ducts under the floor and individually driven machines.

New Plants, Products—In Cincinnati, reinvestment of profits by the Cincinnati Milling Machine Co. in a 5-year expansion program that has added new plants and new products has been disclosed to employees by Frederick V. Geier, president. Company officials declined to estimate the cost of the program which has added a new line of precision grinding wheels, chemicals and castings to the company's line of machine tools.

The grinding wheels will be produced in a new addition, nearing completion, to the Cincinnati Milling production division, which produces Cimcool.

Some Units Operate—While the new plant of the Carlisle Chemical Works, Reading, Ohio, new Cincinnati Milling Machine Co. affiliate, will not open formally until next month, several processing units are already in production of various types of chemicals.

A site has been purchased in Wilmington, Ohio, for a new machine tool division to supplement the company's main plant production. In addition, Cincinnati Milling Machine Co. has acquired the E. W. Wynn Iron Founders Ltd., Cannock, England, for many years a supplier of castings to Cincinnati Milling Machines Ltd., Birmingham, England, the company's British affiliate.

How to make PLANNED assembly savings PAY OFF

AVOIDS 16 TAPPING OPERATIONS

Master Appliance Mfg. Co. switched to P-K Self-tapping Screws for assembly of their Master De Luxe Dryer, found they could skip tapping 16 holes, make a stronger product. Two types of Self-tapping Screws were needed, both available in Parker-Kalon's *complete line*. P-K Type U Screws fasten the sheet steel air intake grille to the side of the die cast aluminum housing, also fasten the aluminum name plate to the grille. P-K Type Z Screws fasten the bearing tension cap to the aluminum dryer housing and the steel switch plate to the housing, and are also used in internal assembly.

This manufacturer wisely planned assembly savings by choosing Self-tapping Screws—then made sure of these savings by specifying P-K. Since the actual cost of screws depends, never on price, *always* on performance, it's common sense to get the best screws money can buy.

Don't let screw failure cancel savings

If you use the wrong type screws, if screws run offsize, break, or otherwise fail, all your planned savings will be lost in slowdowns and scrapped parts. Parker-Kalon, *originators* of Self-tapping Screws, learned long ago how to maintain the uniform quality, in every screw, that keeps assembly humming.

Let P-K* fit the fastener to the job

A P-K Assembly Engineer will help you fit the right fastener to your needs, not your needs to a certain type—because P-K makes a complete line. Find out why the makers of so many of the nation's best-known products say—"If it's P-K . . . it's O.K." Parker-Kalon Corporation, 200 Varick St., New York 14, N. Y. Sold everywhere through accredited Distributors.

TYPE U

TYPE Z
(Also made with Phillips Head)

TRADE MARKS REG. U.S. PAT. OFF.

P-K
TRADE MARK

The Original
PARKER-KALON* SELF-TAPPING SCREWS

A TYPE AND SIZE FOR EVERY METAL AND PLASTIC ASSEMBLY

MERITE

PIG IRON

Highest Quality

MORE USED THAN ANY OTHER MERCHANT PIG IRON

P M

PICKANDS MATHER & COMPANY

UNION COMMERCE BUILDING • CLEVELAND 14, OHIO

CHICAGO • CINCINNATI • DETROIT • DULUTH • ERIE • GRAND RAPIDS • TOLEDO

GREENSBORO • INDIANAPOLIS • MINNEAPOLIS • ST. LOUIS • WASHINGTON

IRON ORE • PIG IRON • COAL • COKE

SIXTY-SIX YEARS OF SERVICE TO INDUSTRY

FREE — USE POST CARD

PUBLICATIONS

New publications that describe money saving equipment and services are available free and without obligation. Copies can be obtained by filling in the attached card and mailing it.

Motor Data

The inside story of Allis-Chalmers Safety-Circle motor protection is given in a new 8-p. bulletin. Design and construction features of the motor which add up to long life and low operating costs are presented; these include a heavy cast iron frame, double insulated stator, diecast rotor, efficient ventilation, drip-proof end brackets, prelubricated bearings, and roomy conduit box. According to the bulletin, these drip- and splash-proof motors are available in sizes from 1 hp at 1800 rpm to 20 hp at 3600 rpm, in frames 326 and smaller. *Allis-Chalmers Mfg. Co.*

For free copy insert No. 1 on postcard.

Overhead Handling

The versatile line of Cleveland Tramrail overhead materials handling equipment that has solved thousands of varied handling problems is described and illustrated in a new 12-p. booklet. Engineering and application data and design information are presented. Various types of hoists, switches, hand or electric carriers, cranes and transfer bridges, Gantry cranes, buckets and grabs are shown. *Cleveland Tramrail Div., Cleveland Crane & Engineering Co.*

For free copy insert No. 2 on postcard.

Furnaces and Pyrometers

The complete line of Hoskins electric furnaces and pyrometers are shown in a 40-p. catalog listing specifications, construction features and chief advantages. Detailed are box furnaces, brazing furnaces, round and rectangular pot furnaces, oil baths, muffle and combustion furnaces, small crucible furnaces, Fieldner types and hot plates. One section deals with pyrometers, and another covers pyrometer accessories. *Hoskins Mfg. Co.*

For free copy insert No. 3 on postcard.

Turning Rolls

Ransome power and idler turning rolls are described in a new 4-p. folder. Advantages producing bigger profits, increased production, less handling, and better welds, manual and automatic, are detailed in the bulletin. Capacities and dimensions of the various models are given, and one page covers self-propelled power and idler rolls. *Worthington Pump & Machinery Corp.*

For free copy insert No. 4 on postcard.

Acid-Proof Construction

Chemsteel facilities for design and engineering, selection and procurement of materials, erection and maintenance in the field of acid-proof construction for all industry are described in a new 8-p. bulletin. The company specializes in engineered acid-alkali-proof construction, serving major steel, chemical, textile and food industries, and in applications where resistance to heat, thermal shock, mechanical abuse, abrasion and erosion are required. *Chemsteel Construction Co., Inc.*

For free copy insert No. 5 on postcard.

Airless Blast Cleaning

Prepared to describe the operation of the Rotoblast method of blast cleaning, a new 20-p. booklet gives examples of its efficiency, versatility, and supplies some of the reasons why industry, generally, considers it a valued tool in the competitive field of mass production. Advantages in the cleaning room are described, and various illustrations of installations on all types of blast cleaning equipment are shown. *Pangborn Corp.*

For free copy insert No. 6 on postcard.

Power Presses

The line of Press-Rite open back inclinable power presses is described in a new 8-p. bulletin. Outstanding features, built-in safety features and specifications for the various models are shown. *Sales Service Machine Tool Co.*

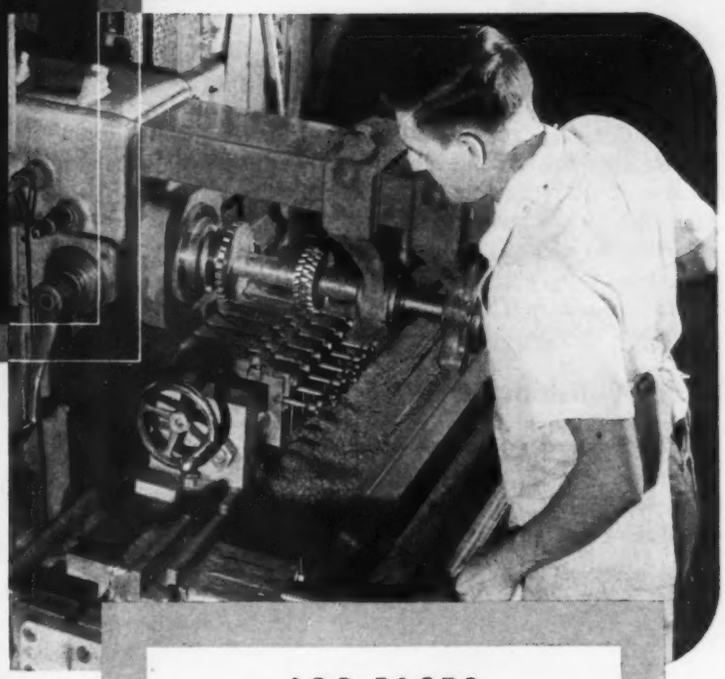
For free copy insert No. 7 on postcard.

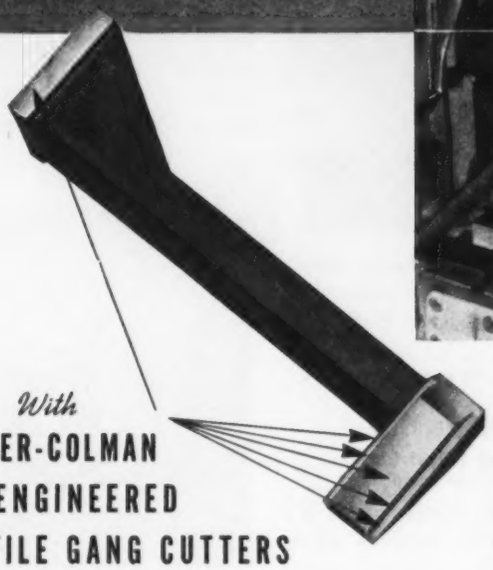
For Insulation Testing

Thirteen models of Hypot high-potential insulation breakdown testers are described and illustrated in a new 4-p. bulletin. Mobile and semi-portable units are included, ranging in capacity from 360 volt-amp to 5 kva, with test voltage ranges from 3000 to 30,000 v ac. Uses described include insulation breakdown testing on

Turn to Page 118

6 SURFACES ON PIECES IN 12 MINUTES





With
BARBER-COLMAN JOB-ENGINEERED PROFILE GANG CUTTERS

JOB FACTS

Operation — Gang Mill 6 Surfaces in 1 pass
Material — Cast Iron
Cutters — B-C Job-Engineered Profile Gang Cutters
Production — 30 pieces per hour, floor-to-floor
Feed — 3"/min. Speed — 100 RPM
Tool Life — 1000 pieces per gang sharpening

Simple arithmetic shows this to be milling cutter efficiency. There is no need for taking 6 cuts in one piece, or one cut in 6 pieces, when it can be done just as easily all in one pass with job-engineered Barber-Colman Gang Cutters. In this case, it takes only 12 minutes to do the job complete . . . *or two minutes each.*

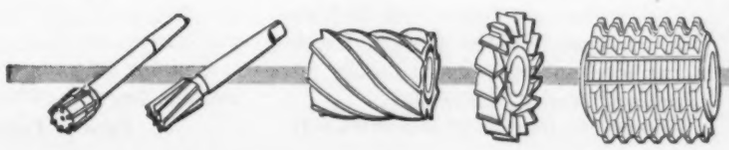
On-the-job efficiency for many milling operations is built into cutter design by Barber-Colman cutter engineers. Their experience with a multitude of job conditions has provided the answer to rising costs and lower productivity on many production milling jobs. Get this same efficiency for *your* production problems. Call a Barber-Colman engineer for recommendations.

FREE

Get this complete catalog of Standard and Special Milling Cutters and Reamers. Write for File No. 8940.

Barber-Colman Company

GENERAL OFFICES AND PLANT, 8940 LOOMIS ST., ROCKFORD, ILLINOIS, U. S. A.



BARBER COLMAN

NEW

PRODUCTION IDEAS

Continued

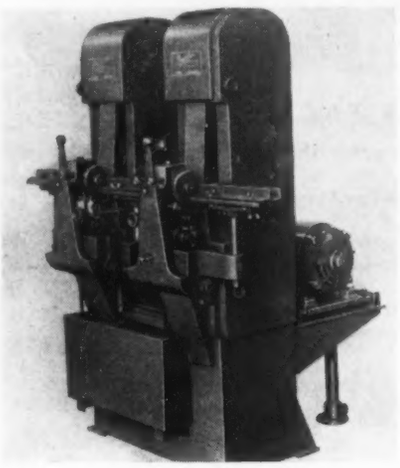
and chevron-type gland packings are suitable for air, oil, or water service. Compact, rugged end caps are furnished to the same mounting dimensions either cushioned or non-cushioned. Two large pipe ports are drilled in each cap—1 in. in the 14-in. bore size, 1¼ in. in the 16-in. size. *Hannifin Corp.*

For more data insert No. 23 on postcard, p. 35.

Duplex Polishing Machine

A fast machine for producing a quality finish on cylindrical work.

Equipped with two polishing heads the Four-Eighty-Four duplex polishing machine uses abrasive,



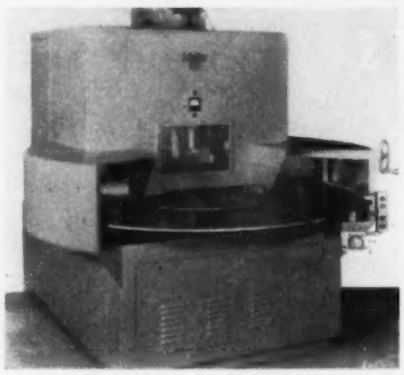
felt, leather or fabric belts to perform a two pass polishing operation on metal, wood, plastic, and fiber. Only a single handling of material is required and many parts may be automatically fed to the machine by hoppers or suitable fixtures. The machine has a capacity up to 1½ in. diam. *Production Machine Co.*

For more data insert No. 24 on postcard, p. 35.

Core Baking Unit

Electronic core baking turntable permits one man operation.

The Model 300-T Thermonic core baking unit has all components in one housing. The tubes are water-cooled, allowing trouble-free operation. A manually-operated electrode adjustment is said to be rapid and accurate. Capacity of the unit is rated at 350 lb of sand cores per hr. It bakes cores up to 15 in. wide x 28 in. long, a maximum combined height of core and core plate of 8 in. The 72-in. diam turntable has adjustable speeds of 0 to 6 fpm.



Core bore blowers, rollover machines and benches can be adjacent to the turntable. *Induction Heating Corp.*

For more data insert No. 25 on postcard, p. 35.

Straddle Carrier

For steel mills and industries having severe service conditions.

Designated Ross Series 100, a new straddle carrier handles 45,000-lb loads, travels up to 33 mph forward or reverse. Full vision design gives road and load visibility and conforms with highway safety requirements. The frame has heavily reinforced and braced formed steel wide box-section side members and tubular upright and cross

members, all electrically welded into a rugged unit. A heavy duty six cylinder 140 hp gasoline engine supplies the power. A 14-in. single plate clutch is non-shock loading. Steering is four-wheel hydraulic and brakes are four-wheel hydraulic, mounted in the wheels. Hoisting mechanism is hydraulically operated. *Ross Carrier Co.*

For more data insert No. 26 on postcard, p. 35.

Stud Welding Power Units

Specifically designed for use with Nelson stud welding equipment.

One of two special power units is a motor-operated generator set capable of welding studs up to ¾ in. diam. This compact unit is equivalent to two 400-amp generators in parallel, comparable to a 200-amp welding generator in size, and weighs approximately 700 lb. Either 220 or 440 v, 60 cycle ac can be used with the unit. A battery unit consists of 12 150-amp wet storage batteries mounted on a strong frame and covered with a hood. Wheels are optional. An automatic charging device is mounted on top of the hood. The unit weighs 1100 lb and can be used for installing studs up to ½ in.

diam with the Nelson automatic stud welding gun. *Nelson Stud Welding Div., Morton-Gregory Corp.*

For more data insert No. 27 on postcard, p. 35.

Multi-Station Gage

Checks critical dimensions of 300 precision eccentric shafts per hr.

One semi-skilled operator can inspect diameters, bearing concentricity, bearing taper, and throw of shaft eccentric in a single operation with a new multiple station Electrolimit gage. Gaging is completely automatic, so that the operator merely loads, notes the dial readings, and unloads. To check a shaft, the operator places it in a cradle at the front of the gage and presses a button. The part is automatically conveyed to gaging position where it is rotated by electric motor between the Electrolimit contact fingers. This actuates the

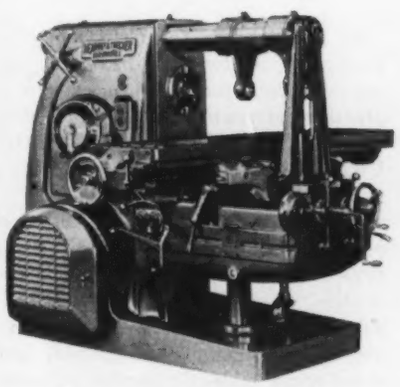
Turn to Page 119

GREATER CUTTING EFFICIENCY

Here's the "business end" of a new CK milling machine — the spindle — with its new dynamically balanced flywheel and Kearney & Trecker's famous, original, extra-rigid, three-bearing spindle design. Added flywheel momentum gives you smoother, more positive cutter drive — the key to Greater Cutting Efficiency using modern cutting tools. And you get increased cutter life, too. The three-bearing spindle design affords ample support and greater rigidity. The heavy duty wide-faced spindle drive gears of forged steel are specially processed for longer life and exceptionally smooth, quiet operation.

A new line of knee-type milling machines

KEARNEY & TRECKER MILWAUKEE **CK's**



New Model CK
25 hp No. 5 Plain Style
Milling Machine

YES, Kearney & Trecker's new CK milling machines are packed with design and operating features that make them *more productive, more profitable for you.*

Spindle-mounted flywheel, broad feed and speed ranges and greater horsepower with separate motor drives for spindle, and feed and rapid traverse, mean you get fullest possible benefit from modern cutting tools.

New CK columns give you greater rigidity. Compared to former columns, they give you 1000 pounds more metal in heavier ribbing, in box-type, sponson construction to absorb vibration from heaviest cutting loads.

For greater production, these machines are equipped with Kearney & Trecker's famous Mono-Level Control that shortens floor-to-floor time, and materially reduces operator fatigue. New, non-glare micrometer dials help avoid costly errors in reading . . . give you a positive lock at every setting.

Automatic flood lubrication in column and knee and positive metered lubrication to table and saddle, plus generously proportioned gears and shafts assure you greater machine life.

Find out for yourself about Kearney & Trecker's new CK line of knee type milling machines . . . how they meet every demand of modern milling practice . . . how they can give you greater production at greater profit.

Sizes are No. 2, 3, 4, 5, and 6 . . . Plain and Universal styles. For complete details, contact your nearest representative or write direct. Kearney & Trecker Corp., 6784 W. National Ave., Milwaukee 14, Wisconsin.

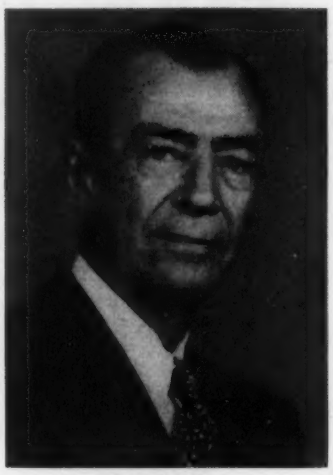
REPLACEMENT OF OBSOLETE MACHINE TOOLS IS AN INVESTMENT THAT MAKES BOTH DOLLARS AND SENSE

KEARNEY & TRECKER MILWAUKEE MACHINE TOOLS

Iron Age *Introduces*

ROBERT L. COE, elected chairman of the board, Chase Brass & Copper Co., Inc.

RICHARD C. DIEHL, named president, Chase Brass & Copper Co., Inc.



HAROLD D. WILSON, appointed vice-president of the Gary Steel Supply Co., Chicago.

Gordon A. Jacobs was named representative in charge of the Dallas Div., which includes the states of Texas, Louisiana, Oklahoma and Arkansas, for DETREX CORP.

Curtis A. Haines, formerly general manager of the photoflash division, has been appointed general manager of operations for the radio tube division and television picture tube division of SYLVANIA ELECTRIC PRODUCTS, INC.

William A. Bohlander has been appointed factory manager of the HYDRAULIC PRESS MFG. CO., Mount Gilead, Ohio. Mr. Bohlander was previously associated with AETNA STANDARD ENGINEERING CO. as superintendent.

Charles Cubbison has been named assistant general plant manager and **Joseph Cavanagh** has been appointed assistant purchasing agent for the ink division of the J. M. HUBER CORP.

J. R. Munro, general factory manager, has been appointed to the newly created position of director of manufacturing for CATERPILLAR TRACTOR CO. **C. A. Woodley** was named general factory manager, **W. L. Naumann** and **Lloyd J. Ely,** assistant factory managers.

Charles W. Fallon was made supervisor of the internal audit staff for the middle western area, U. S. STEEL CORP. OF DELAWARE. His headquarters will be in Chicago. He succeeds **Chilton K. Ross,** who recently vacated the position when he was elected comptroller of GUNNISON HOMES, INC., U. S. Steel's prefabricated home manufacturing subsidiary at New Albany, Ind.

J. E. McQuaid was named to the post of sales manager of the contractor's equipment division for ELECTRIC STEEL FOUNDRY CO., Portland, Ore. Mr. McQuaid will headquarter in Portland. **Wilvon V. Latimer,** for the past several years the assistant manager at the ESCO Seattle office, is simultaneously promoted to managership of the branch succeeding Mr. McQuaid.

Sherman S. Cross was appointed operations manager of BRAINARD STEEL CO., Warren, Ohio, succeeding **J. Howard Patton,** who recently resigned. He has been serving as chief product engineer since 1949.

Mario A. Gardner was promoted to the post of vice-president in charge of purchases for AIR KING PRODUCT CO., Inc., Brooklyn. Mr. Gardner was formerly director of purchases.

Almo D. Squitero was appointed to the post of electrochemist in the laboratory of HANSON-VAN WINKLE-MUNNING CO., Matawan, N. J.

Samuel M. Felton has been elected president and chief executive officer of SHIPPERS' CAR LINE CORP., a subsidiary of the AMERICAN CAR & FOUNDRY CO.

L. R. Wanner, formerly manufacturing superintendent, has been appointed plant manager in charge of plastics operations for the parts division, SYLVANIA ELECTRIC PRODUCTS, INC.

Kenneth G. Lundie was elected vice-president in charge of sales and **Perry Brown** was elected vice-president in charge of engineering for JOHNSTON PUMP CO., Los Angeles. Mr. Brown had been chief engineer and Mr. Lundie formerly served as sales manager.

George Bastianello was appointed assistant sales manager of the business services departments of REMINGTON RAND, INC.

Charles W. Strine was named the new comptroller of the PENNSYLVANIA FLEXIBLE METALLIC TUBING CO.

Ellis H. Jones is retiring as general manager of the Canadian Div. of YALE & TOWNE MFG. CO. after 57 years of service. **George L. Dirks** was named to succeed him.

James P. Kinney has been appointed general sales manager to succeed **Samuel W. Gibb,** who recently resigned, in the Philadelphia Div. of YALE & TOWNE MFG CO. **James A. Shellenberger** was appointed director of advertising, publicity and market research. **John T. McCarley** was named to the newly created post of manager of production. **C. Eugene Moore** was appointed works manager and **Bruno A. Moski,** chief industrial engineer.

Charles W. Frick is the new works manager of the propeller division of CURTISS-WRIGHT CORP., Caldwell, N. J. **George E. Savaria,** former superintendent of machine shops and assemblies, was promoted to superintendent of steel blade manufacturing to fill the vacancy created by the recent death of **Russell Richardson. Warren P. Cross,** former superintendent of production machine shops, was elevated to superintendent of machine shops and assemblies, replacing Mr. Savaria. **Harold B. Snyder** was appointed superintendent of production machine shops succeeding Mr. Cross.

Philip Getter, erecting engineer for KOPPERS CO., INC., has been awarded the Bernardo O'Higgins Order of Merit in the rank of Commandador by the order of His Excellency Gabriel Gonzales Videla, president of Chile. The award was made in connection with Mr. Getter's part in the construction of a 700-ton per day integrated steel plant for the PACIFIC STEEL CO. of Chile.

DONALD L. ANDE, appointed manager of sales, warehouse products, for Jones & Laughlin Steel Corp.

Iron Age Salutes

GEORGE W. MASON

HE'S a dry fly trout fishing purist with an uncanny ability to pick the right fly, then gently pin point cast where the big ones bite.

He runs his business the same way, with skillful selection of top executives and precision aim at sales targets for Nash automobiles, Kelvinator and Leonard electric appliances. He typifies the aggressive, pioneering independent in both fields.

Faced with tough competition from the nation's fastest-thinking, fastest-moving industries, he has boosted volume every year for the last 10 rough and tumble years.

As president and chairman of the board of Nash-Kelvinator Corp., he is in the vanguard of the independent companies' determined fight to stay in business. The industry giants know that with Mason at the helm, Nash-Kelvinator will continue to be heard from.

As a youngster in his home town of Valley City, N. D., George Mason liked to tinker with automobiles. After graduating from the University of Michigan in 1913, he spent short periods with Studebaker and Dodge. During World War I, he coordinated the activities of the Rock Island Arsenal for the Army Ordnance Dept. At war's end, he joined the Irving National Bank in New York to acquire a knowledge of banking and finance.

In 1921 he returned to the auto industry, this time with Maxwell, which was being reorganized by the late Walter P. Chrysler. In 1924 Mason became works manager in charge of production of the first Chrysler car. Two years later, when mechanical household refrigeration was developing in popularity, Mason became vice-president of Copeland Products, Inc. Elected president in 1927, he resigned in 1928 to head the Kelvinator Corp. of Detroit. He was only 38.

In 1936 Charles W. Nash offered Mason the presidency of Nash Motors of Kenosha, Wis. Negotiations finally resulted in a merger of Kelvinator and Nash Motors, with Nash as chairman and Mason as president of the Nash-Kelvinator Corp. Upon Nash's death in 1947, Mason took on both jobs.

In 1946 he was elected president of the Automobile Manufacturers Assn., and still holds the post. Previously he was treasurer.

ERNEST A. HUND, named vice-president of Push-Button Foundry Equipment Div., W. G. Reichert Engineering Co., Newark.

RICHARD H. DIESEL, appointed director of purchasing for the Stamford Div., Yale & Towne Mfg. Co.

DR. R. W. SANDELIN, who recently became head of the metallurgical department, Conners Steel Co., Birmingham.

Gerald C. Quinn, editor since 1945 of the ALLIS CHALMERS *Electrical Review,* has been appointed supervisor of industrial press relations. He succeeds **N. H. Jacobson,** who has joined the Atomic Energy Commission in the newly created position of technological information officer.

M. A. Moore has been appointed sales and service representative for DOUBLE SEAL RING CO., of Fort Worth, Texas, Vermont and New Hampshire. Mr. Moore was formerly with GENERAL MOTORS CORP. as supervisor of sales and service for diesel engines at Houston. His new headquarters are in Georgetown, Maine.

Thomas J. Lopiccolo has been appointed general sales manager of the refrigeration division of BOWSER, INC. **John Zaleski** was appointed exclusive distributing agent for government sales for the refrigeration division and **Dr. John Gelb** became associated with the company in the capacity of research and development engineer.

Dr. R. H. Lueck was named general manager of research for the AMERICAN CAN CO. He has been serving as manager of sales for the Pacific division since 1944. **A. C. Staley, Jr.,** assistant general manager of sales, was named manager of the company's Pacific division.

Dr. James L. Lawson has been appointed manager of the newly formed Electron Physics Divisions of the GENERAL ELECTRIC research laboratory. **Clifford G. Fick** has been named assistant manager.

Sidney L. McLean has been appointed tax supervisor of COLUMBIA STEEL CO., U. S. STEEL CORP. subsidiary. He will succeed **Byron Shelton,** recently transferred to the tax staff of the corporation at New York.

Byron L. Smith was handed the new post of district sales manager of the territory of Kansas, Nebraska, Oklahoma and western Missouri with headquarters in Kansas City, for CONTINENTAL STEEL CORP., Kokomo, Ind. He has been with the company for almost 15 years and for the past 2 years has been located in Oklahoma City as sales representa tive for the state of Oklahoma.

William F. Williams has been appointed vice-president in charge of manganese sales for TAYLOR-WHARTON IRON & STEEL CO., High Bridge, N. J. **H. E. Cragin, Jr.,** was named assistant vice-president of manganese sales. Mr. Williams has been serving as director of manganese sales and Mr. Cragin as assistant to the president for engineering and research. **John P. Reynolds** was named assistant sales manager. He had been serving in the sales department.

Lloyd E. Young was made sales manager of the SUPERIOR STEEL & MALLEABLE CASTINGS CO., Benton Harbor, Mich.

Warren H. Farr, vice-president in charge of manufacturing of THE BUDD CO. for the past 4 years, will resign effective Jan. 1. He will continue as a member of Budd's board of directors and will act as a consultant to Mr. Budd.

Henry D. Bixby was appointed to the staff of the PERENY EQUIPMENT CO., Columbus, Ohio. Mr. Bixby was formerly research engineer in the ceramic and electrical engineering division of the BATTELLE MEMORIAL INSTITUTE.

Joseph J. Marsalka, research laboratory supervisor, BLAW-KNOX CO., has been appointed technical director of the ROLL MFRS. INSTITUTE, Pittsburgh.

OBITUARIES

George C. Adams, 59, sales representative for Joseph T. Ryerson & Son, Inc., died recently.

Ernest S. McClary, secretary and treasurer of E. W Bliss Co., passed away on Sept. 23.

John F. McMahon, 47, managing director of the Industrial Hygiene Foundation of Mellon Institute, died Sept. 15 at Pittsburgh.

Paul Henry Haller, Jr., former general accountant of the U. S. Steel Corp., died on Sept. 25.

H. H. Robertson, 72, board chairman and former president of the H. H. Robertson Co., died on Sept. 20.

Sidney Graves Koon, 75, retired associate editor of *Marine Engineering* and of THE IRON AGE, passed away recently.

Benjamin H. Jones, vice-president in charge of sales, National Screw & Mfg. Co., Cleveland, died Sept. 21.

REVERE Free Cutting Brass Rod Makes "Duck Soup" out of Deep Recesses!

ANYONE who has set-up a lathe or tooled-up an automatic can see at a glance that the Eastman Pressed-On Hose Coupling is not the easiest thing in the world to machine from the solid.

On one end the boring, chamfering, deep turning to a pipe thread taper up to a round shoulder, and threading, are neither very difficult nor very easy to handle.

But look at that deep recess on the other end! It has reverse under-cut annular serrations that are so clean and accurate that the coupling holds a hydraulic hose with a grip that is stronger than the hose itself.

Anyone who had to do that job would want to work on a material which had all the ease of machining and uniformity of behavior under the cutting tools he could get. That is why the Eastman Manufacturing Company, Manitowoc, Wisconsin, uses 1 3/16" diameter Revere Hexagon Free Cutting Brass Rod in this patented coupling. All of the production problems are in the tools, none are in the material.

The difficult tasks are not the only ones on which the ultimate of machinability will pay off. If you want to work to combinations of speeds and feeds and accuracies which are even a little bit beyond the ordinary, or you have a job which is even a minor challenge to your tool makers and your set-up men, then Revere Free Cutting Brass Rod may be your best friend.

It will not cost anything to find out. Just get in touch with your nearest Revere Sales Office.

REVERE

COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

230 Park Avenue, New York 17, New York

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Mills: Baltimore, Md.; Chicago and Clinton, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Rome, N. Y.

Sales Offices in Principal Cities, Distributors Everywhere.

On the ASSEMBLY LINE

AUTOMOTIVE NEWS AND OPINIONS

Henry J. makes debut . . . Car designed for both operating and manufacturing economy . . . Chrysler introduces pressure cooling . . . Goodyear synthetic rubber on way

By WALTER G. PATTON

Fulfills Promise—Henry Kaiser made good another of his promises to the public last week when he introduced the 2300 lb Henry J. This is the first American postwar car designed from scratch to provide (a) maximum operating economy, (b) optimum performance and (c) minimum price. (The Nash Rambler also qualifies on each of these counts except the last. THE IRON AGE, Apr. 13, 1950, p. 64.

It took impatient, fast moving Henry Kaiser 7 years to design the Henry J. and get it into production. The new car brushes aside many near-sacred automotive traditions. K-F executives frankly admit both the car itself and the route it will take to the market are unique. The 4-cylinder model will be available for $1299 at Detroit. This is before license, state tax and delivery charge. The 6-cylinder deluxe model is priced at Detroit at $1429.

This will be the first time the public has been offered a full-size light car stripped of all frills since Henry Ford abandoned his Model A. However, if the buyer wants accessories—heater, radio, white side walls, overdrive, etc.—these will be available.

Weight Kept Down — Kaiser's approach to the transportation problem, like that of Nash, started with the concept of providing basic transportation only. At one time, a vehicle was designed that weighed only a few pounds more than Henry Kaiser and three of his associates who took a ride in it. From that time on, every additional pound was challenged. Each increment in passenger and luggage capacity was checked and rechecked to see that it was absolutely essential. All told, about 50 prototypes were built. K-F engineers had a formula—Performance, Appeal and Price—that restricted them in many ways in engineering the car.

The car as finally designed weighs about 800 lb less than a conventional low-priced car. Initially at least, only two-door models will be built. All will be solid color; two-tone jobs are out for the present. The front grille, while pleasing to the eye, eliminates all unnecessary parts. K-F engineers say they have reduced the major stampings from 140 in a conventional car to 80 in the Henry J. An example of this is the roof stamping which extends from the windshield clear back to the floor pan.

Manufacture Simplified—K-F engineers have missed few bets in simplifying the Henry J. for manufacturing purposes. The instrument panel, for example, is a steel stamping, painted the same color as the car itself. The usually separate garnish moldings are integrated into the body design and painted the same color as the outside of the car.

Features like these, plus use of shallower seat cushions and elimination of the rear deck opening and vent windows in the doors may appear to be over-simplification to some buyers. Nevertheless, Henry Kaiser has given the prospective buyer who says he wants good basic transportation and nothing else exactly what he has asked for. At the same time, K-F has made it possible to buy any accessories that may be desired, including the vent windows which are omitted on the base model.

Repairs Simple — Another feature of the Henry J. that is quite

certain to be appreciated is that this is probably the first car since the model A on which the owner can work easily. Accessibility of all parts of the engine, for example, is excellent. Performance of the car is remarkable. The 6-cylinder model we drove last week had plenty of reserve power and is surprisingly free from vibration.

The powerplant is an L-head engine built by Willys (not the Willys F-head). The four cylinder engine is rated at 68 hp and the six at 80 hp. Engine features include counter-balanced crankshaft and positive air cooling of the lubrication system. Front leg room is 42 in. Headroom is 37½ in. in front and 35 in. in the rear. Doors are 57 in. wide. Tread is 54 in. The rear seat folds over to become an extension of the floor, providing a loading space of 50.3 cu. ft. Upholstery trim that can be readily changed is employed. Rear fenders are bolted on for easy replacement.

25 to 27 Miles Per Gallon—Henry Kaiser had his original sights on a $1000 car with a $200 price advantage over other low-priced cars. Inflation blew the price up to $1300 minimum. The $200 price margin over competition is not there—at least for the present. If Chevrolet, Ford and Plymouth boost their prices, the Henry J. will approach such a price advantage. However, when the economies resulting from 25 to 27 miles per gal are added to lower license fees, lower priced tires and reduced maintenance costs, the Henry J. should get favorable consideration from many prospective car buyers.

K-F marketing experts feel the potential market for a second car in the family plus buyers of good used cars who want low maintenance expense should give them about all the volume they need right now to put them permanently—and importantly—into the automobile business. This business should come to them, they argue, without taking too many orders away from the Big Three.

Chrysler Makes Change—Chrysler's new Pressure-Vent Radiator Cap offers an advantage to motorists which is certain to be widely appreciated. Under abnormal driving conditions the Chrysler cooling system is sealed permitting pressure to build up and preventing boiling of the radiator. The new feature will prevent loss of non-permanent anti-freeze and will be particularly advantageous to cars pulling trailers, driving up steep hills or operating bumper-to-bumper during the hot summer.

The new Chrysler radiator cap is a special vent valve which controls the pressure in the cooling system. When the temperature in the system rises to the boiling point, "pressure cooling" occurs. The vent valve is forced shut and seals the cooling system.

Supplies to Limit Production—Whether or not automobile production reaches an all-time record in 1950 will depend on the availability of supplies during the last quarter. During the first 9 months of 1950, U. S. plants turned out more than 5 million cars, more than in any entire year with the lone exception of 1949.

The industry could hit 6,600,000 by building about 530,000 cars per month in the fourth quarter. This compares with average production during the July-September period of 630,000 vehicles per month. Last week the materials lines were drawing tighter. Wire, stainless steel, cold rolled sheets, nickel, and other nonferrous metals were reported to be as critical as at any time during the postwar period.

To Reopen Goodyear Plant—The Goodyear synthetic rubber plant idle since May, 1947, is being rehabilitated and will resume production of latex rubber within 90 days or less. The plant has a capacity of 30,000 long tons. The plant will be operated by Goodyear for the Rubber Reserve.

THE BULL OF THE WOODS — **By J. R. Williams**

HAH
HO HAAH
HAW HA
HAWP
HO
COME ON, HAMP, WE'RE MISSIN' IT--THEY MUST HAVE SOME GOOD ONES TODAY!
NO, I GOT MY FAVORITE LUNCH TODAY--I NEVER KNOW WHAT I'VE ET, OR THAT I'M EATIN' AT ALL, IN THAT KOO-KOO'S NEST!
10-6
J.R.WILLIAMS
THE ISOLATIONIST

The Power of Competition

The snap of the ball, the competitive efforts of trained men, and suddenly a halfback breaks into the clear for a touchdown. Rugged competition on the gridiron thrills the crowd. More important, it builds strong bodies for young men.

Free competition strengthens industry, too, makes it healthy and ready for any emergency that may threaten our way of life. Wisconsin Steel believes in the power of competition. It has inspired us to increase our productive efficiency, and through research and quality control, to produce better products for our customers.

INTERNATIONAL HARVESTER

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WISCONSIN STEEL

WEST COAST PROGRESS REPORT

Digest of Far West Industrial Activity—By R. T. REINHARDT

It Is Up to the Public—If Kaiser Steel Corp. is successful in its efforts to raise approximately $125 million through private financing for which it has filed a registration statement with the SEC, the West will have facilities to produce an additional 200,000 tons of tinplate per year and an increased ingot capacity of 180,000 tons per year.

The financing involves issuance of $60 million of first mortgage bonds at 3¾ pct due in 1970 which will be sold to institutional investors; $25 million in bank credits through an agreement with the Bank of America, Mellon National Bank and Chase National Bank; and $40 million to be raised through the sale of 1,600,000 shares of preferred stock and 800,000 shares of common stock to be offered in units of one share preferred and one-half share of common.

Twenty-four million, five hundred thousand dollars will be used to construct the tinplate facilities and the eighth 200-ton open hearth; additional soaking pit and blooming mill facilities.

Will Repay RFC—It is the announced intention of the corporation to repay the Reconstruction Finance Corp. in full the balance of $91,082,990 still due on the wartime loan made to establish the steel plant at Fontana.

New directors elected to the board of Kaiser Steel Corp. last week were: J. L. Ashby, vice-president and general manager of Kaiser Steel; George W. Burpee, New York, a partner in Coverdale & Colpitts, engineering firm of New York; Sam H. Husbands, San Francisco, president Trans-America Corp.; Edgar F. Kaiser, Willow Run, Mich., president of Kaiser Frazer Corp.; Henry Kaiser, Jr., Los Angeles, and George D. Woods, New York, chairman of executive committee of the First Boston Corp.

Man-power First Shortage? — Skilled manpower will become more scarce than steel for many companies working with "hard" materials, predicts Paul I. Berno, merchandising manager for Tappan Stove Co. During a visit to Los Angeles, he said, "The shortage of materials is threatening, but I believe that the manpower shortages will catch us first, and that we will probably have to curtail our production for that reason."

War Impact in Utah — While steel fabricators of this area have received few war orders, stepped-up defense activities have loaded them with work. Expansions and new facilities at military installations in the area, which were planned before outbreak of the Korean war, have been given added urgency.

Industrial plants to increase the nation's supply of metals are likewise being pushed. A specific example is the cobalt refinery near Garfield, Utah, which was underway before the new defense program was inaugurated. The pressure is on to get it into operation in a hurry.

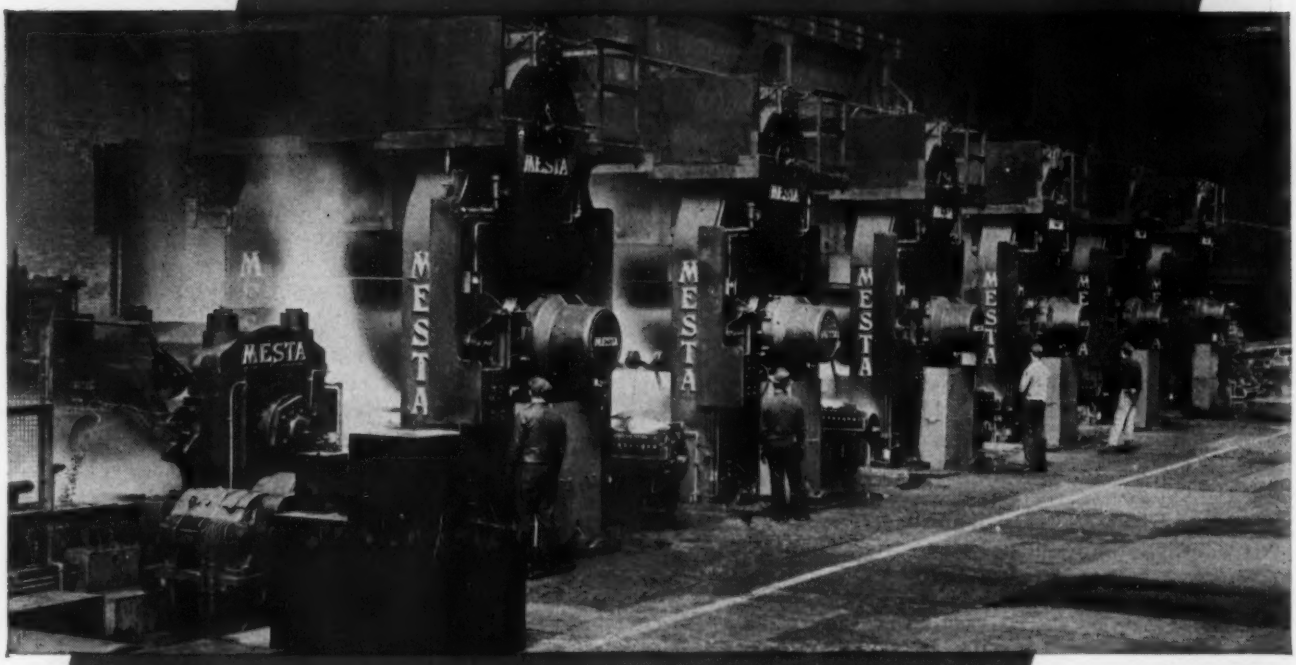
Steel inventories of fabricators are dwindling but no acute shortage has been felt as yet. The No. 1 headache of the industry at present is skilled workers. The draft is cutting in enough to create what one fabricator termed "a terrible shortage" and there just aren't any replacements in the area. An official of another firm said he had been advertising for skilled mechanics for weeks with absolutely no results.

San Diego Feels Steel Shortage —Cuts in allocations of steel are being felt severely in some lines of work in San Diego. One of the hardest hit is National Steel, which builds steel 121-ft tuna clippers and does structural work. Firm commitments previously made are allowing the company to continue work with six of the large steel boats now on the ways, but tonnage received has been cut far below the 900 tons normally received monthly, according to Ray Fox, executive vice-president.

Shortage of materials has forced the Navy to rescind a previous order which sent most of its purchases through its central Los Angeles area offices. Naval bases at San Diego now are authorized to purchase steel and other equipment locally, if they can find it.

Gray iron foundries are enjoying brisk business and are getting a sufficient supply of scrap to keep their cupolas hot.

TRIPLE PROTECTION FOR ROLL NECKS



Mesta Machine Photo

Guard against friction, heavy loads and high temperatures by using TEXACO REGAL OILS

With *Texaco Regal Oils* in your circulating systems, your oil film roll necks will always have super-tough lubricating films to roll on. These turbine-grade oils keep oil lines clear, permitting clean, cooling lubricant to flow constantly to the bearings. This means trouble-free performance, uninterrupted production, longer bearing life, lower maintenance costs.

Texaco Regal Oils embody high resistance to oxidation, emulsification and sludging. Their friction-fighting films stand up under heavy loads and high temperatures. Operators everywhere get better results with *Texaco Regal Oils.*

Over on the drive side, protect your heavy-duty enclosed gears by using *Texaco Meropa Lubricants* — noted for their high load-carrying capacity and high resistance to foaming and oxidation. Both gears and bearings will last longer.

There are many ways in which a Texaco Lubrication Engineer can help you increase efficiency and reduce costs. Just call the nearest of the more than 2,000 Texaco Wholesale Distributing Plants in the 48 States, or write:

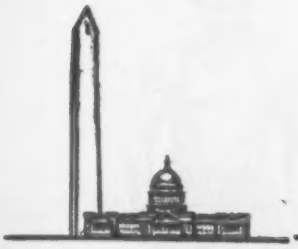
The Texas Company, 135 East 42nd Street, New York 17, N. Y.

VISIT THE TEXACO EXHIBIT AT THE METALS SHOW · BOOTH 1906 · CHICAGO, OCTOBER 23-27

TEXACO

TEXACO Regal Oils
(HEAVY-CIRCULATING OILS)

TUNE IN . . . TEXACO STAR THEATER starring MILTON BERLE on television every Tuesday night. See newspaper for time and station.



THE FEDERAL VIEW

THIS WEEK IN WASHINGTON

By EUGENE J. HARDY

New Security Rules—The Munitions Board has issued uniform regulations covering procedures for clearing facilities and personnel to handle classified material contained in Army, Navy or Air Force contracts.

A central security file has been established to maintain data on all individuals, organizations, facilities, factories, etc., that have been cleared by the military departments. Clearance by any one of the three military services will be sufficient and will eliminate the need for repeated security checks by the various departments as has been the case in the past.

Check List Approved—A security requirements check list has also been approved and is being used to break all contracts down so that only those parts or items in the contract which are actually classified will have to be protected as classified material. The rest of the sub-assemblies, items, or portions of the contract can be handled as unclassified material. For example, if in a gas engine only the ignition system is classified, by using this check list, only those who are actually involved with the ignition system would have to submit to a security clearance.

A uniform visitor's clearance procedure has also been issued to the three military services. This will eliminate a multiplicity of checks when anyone desires to visit plants holding military contracts. In addition, any plant that has a classified contract with two or more military departments will now be assigned to a single department for administration of security.

Watchdog Committee—Industry can expect a fair break from all members of the new Congressional watchdog committee set up to check on administration of the Defense Production Act with one exception, Rep. Patman, Dem., Texas. Mr. Patman has consistently crusaded against business generally under the guise of alleged solicitudes for so-called small business.

U. S. May Insure Lake Boats—The coming of winter may no longer mean a close to shipping lanes on the Great Lakes. Because private concerns won't insure ore ships plying the ice-choked waters, a bill authorizing the Federal government to write insurance on these carriers is being pushed.

The bill, under the sponsorship of Rep. Alvin F. Weichel, R., Ohio, has been favorably reported to the House by the Committee on Merchant Marine and Fisheries. Weichel says he will push for enactment at the November session of Congress.

FTC Appointment—If confirmed by the Senate, President Truman's latest appointment to the Federal Trade Commission, Stephen J. Spingarn, will be no help to industries confronted with the knotty problem of the legality of delivered prices and freight absorption. Mr. Spingarn, a New York Democrat, would bring the Commission up to full five-man strength.

He had a large hand in preparation of the data on which Mr. Truman based his veto of S. 1008, the so-called basing point bill. Before moving to the White House staff last year, he held a number of legal posts in the Treasury Dept. Known as a slightly "left of center" economic thinker, he will be closely questioned by the Senate Commerce Committee particularly with regard to his position on delivered prices. Insiders say he faces a battle for confirmation.

National Science Foundation—President Truman is expected to appoint the 24-man board to run the National Sciences Foundation within the next few months now that Congress has appropriated $225,000 to get this new arm of the Government underway. Originally, the Budget Bureau had asked for $475,000 but the House refused to approve any funds on the grounds that new projects which would not provide early aid to defense efforts should not be started.

The Senate approved $225,000 and this amount stayed in the appropriations bill. The funds will be used to survey the existing needs in basic scientific research and to form plans for research and training in the sciences. Contracts, scholarships, grants-in-aid and other provisions of the law will not be started until sometime after mid-1951.

at mid-century:

a look at the first fifty years . . .
a pledge for the ones to come

A few short years before the beginning of the twentieth century . . . in an atmosphere of national economic distress . . . Inland Steel got its start in life. With $65,000 in hand, the infant set out to make its way in midwestern industry. Its aim: to make steel the way steel users wanted it, at a fair price, and on a fast schedule.

The Midwest grew and Inland grew with it. After two world wars and an unprecedented depression, Inland is still growing. Today, in this perplexing state of "warm war," additional ingot capacity is underway. By 1952, we will have 45% more capacity than we had before World War II.

Yet, even with increased rates of production, the war-stimulated demand often presses beyond our ability to give the kind of service you have come to expect from Inland. We will continue to exploit every practical device and method to get the steel you need to your plants as fast as possible.

We'll continue to shoot at the same target during the next 50 years—*steel . . . the way you want it when you need it.*

	Inland in 1900	*Inland in 1950*
Ingot capacity:	**none***	**3,750,000 tons**
Tons of finished products shipped:	**23,000**	**3,200,000**
Total assets:	**$435,000**	**$325,000,000**
Number of employees:	**250**	**25,000**
Investment per employee:	**$1,740**	**$13,000**
Annual Payroll:	**$142,000**	**$96,000,000**
Average annual wage:	**$570**	**$3,840**

(All figures are approximate)

PRODUCTS MANUFACTURED:

1900

Bars, Harrow teeth, Plow beams, Fence posts

*First open hearth furnace installed in 1902.

1950

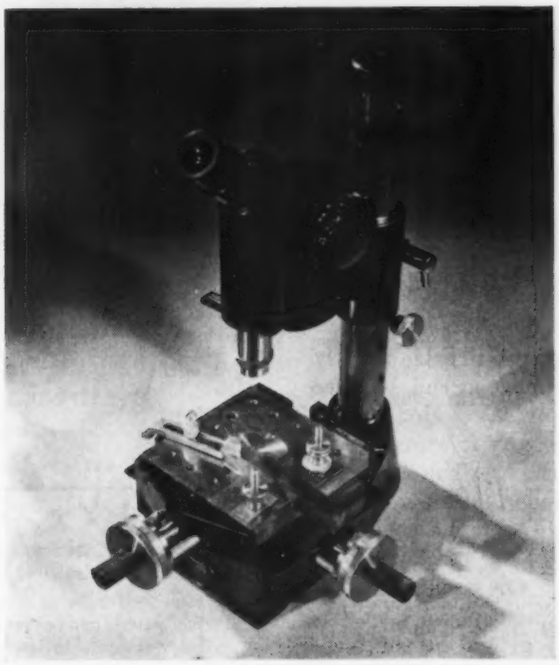
Hot rolled sheets and strip, Cold rolled sheets and strip, Enameling iron sheets, Electrical sheets, Galvanized sheet products, Hot dipped tin plate, Electrolytic tin plate, Black plate, Plates, 4-WAY Safety Plate, Bars, HI-BOND reinforcing bars, Structural shapes, Sheet piling, Fence posts, Sign posts, Rails, Joint bars, Tie plates, Track spikes, Pig Iron, Coal chemicals, Special steels.

INLAND

INLAND STEEL COMPANY

38 South Dearborn Street • Chicago 3, Illinois

Sales Offices: Chicago, Davenport, Indianapolis, Kansas City, Milwaukee, New York, St. Louis, St. Paul.



Microscope Method Expedites Machinability Tests

By THOMAS BADGER
Manufacturing Engineer,
Headquarters Manufacturing Engineering Laboratory,
Westinghouse Electric Corp.,
East Pittsburgh

A novel method for determining machinability utilizes microscopic measurement of tool wear and graphical determinations based on tool wear rate. Method is very accurate, and much faster than conventional machinability tests.

A METHOD has been developed at the Westinghouse Electric Corp. that gives rapid and very accurate evaluation of tool life in any cutting application. The method is general and can be used for evaluating the quality of cutting tool materials, determining the effects of cutting fluids, selecting the optimum speed and feed for lathe or milling operations, and determining relative machinability of metals. It is known as the microscope method, because the use of a microscope to accurately measure tool wear is an important part of the procedure.

For any single point cutting tool, or any one cutting edge of a multiple-point cutting tool, it is evident that tool life is equal to total tool wear divided by the rate of tool wear. Thus, if a tool is considered dull after 0.030 in. of wear, and under the given conditions of speed and feed the

tool wears at the rate of 0.001 in. per min, the tool life will equal 30 min.

A simple system which permits test data to be taken to a great degree of accuracy with a minimum of equipment, is one in which the above units are expressed as follows:

Tool life = Total metal removed per tool grind in cubic inches.

Total tool wear = Tool flank wear in thousandths of an inch.

Rate of tool wear = Wear of tool flank per removal of 1 cu in. of work material.

In this system of units tool life is directly proportional to clock time, and so can be used as a relative measure for any calculation involving tool life. As long as tool life is expressed in cubic inches, this value can be handled very simply in algebraic equations. At any desired time, tool life in cubic inches can be converted to clock time by dividing tool life by the rate of metal removal per minute. The metal removal rate is easily calculated by multiplying the cutting speed by the depth of cut and by the feed, with cutting speed expressed in inches per minute and depth and feed in thousandths of an inch.

With the above facts in mind it is obvious that tool life can be determined if a desired total tool wear is known, and if a test to determine the rate of tool wear is possible. It has been common practice to consider 0.030 in. of flank wear as the point where a tool is ready for regrinding. Actually, any value below the point where a sudden breakdown or chipping of the tool occurs is satisfactory, as long as this value remains constant in any discussion. Test experience has proved the 0.030-in. value to closely approximate desirable shop conditions.

To determine the wear rate it is first necessary to measure tool wear under test conditions. Fig. 1 shows in exaggerated form the typical flank wear that occurs on a cutting tool when used on turning cuts. Under perfectly controlled conditions the wear rate measured at any one point of a tool would be proportional to that measured at another point, but the absolute values would vary widely. This would permit wear to be measured at any convenient place. Experience has shown that if this wear is measured at a point on the cutting edge at the midpoint of the depth of cut, best test results are obtained. In Fig. 2, the vertical line through A shows the most convenient location for the measurement of tool wear.

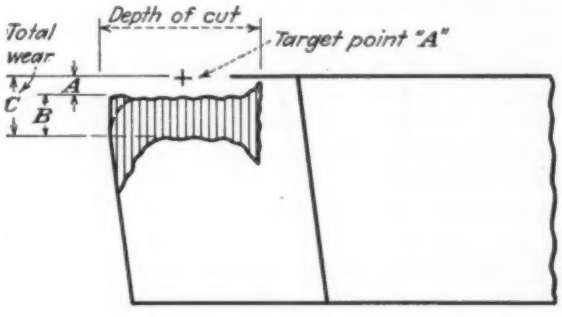


FIG. 1—Profile of a cutting tool, showing typical flank wear from turning. Vertical scale of the wear pattern has been exaggerated on this sketch.

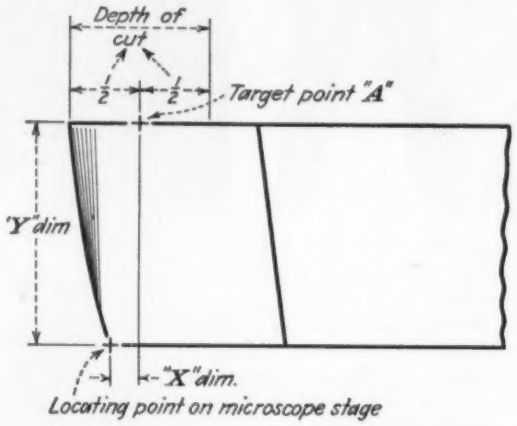


FIG. 2—Profile of a typical turning tool, showing the points and dimensions used in wear analysis for machinability test.

The tool to be tested is placed on the stage of a toolmaker's microscope. Stops and clamps are used so that the tool can be readily positioned at the stage after each cut. Before making a test, the tool to be used is set on the stage of the microscope and the vertical and horizontal position of the midpoint of the cutting edge is determined from some reference point. Fig. 2 shows a convenient method of taking these measurements, using the corner of the tool under the nose radius as the reference point. The values of the X and Y dimensions are easily obtained from the micrometer readings of the microscope. Once these measurements are known, it is always possible to locate the original position of A even after this point has been obliterated by using the tool.

Wear Measured With Microscope

After the values X and Y are determined, the tool is used in the test setup to remove a small amount of material, and the resulting wear is measured by the toolmaker's microscope. The amount of metal removed usually varies from 3 to 10 cu in. for difficult machining materials, and from 10 to 30 cu in. for free machining materials. The proper value can easily be determined by taking a few test cuts to assure that tool wear produced by the selected metal removal is more than approximately 0.0015 in. and less than 0.004 in. For most materials, 10 cu in. of metal removed is a good value. This value is not critical, nor does it have to be maintained accurately from cut to cut; but a proper selection does make for convenience and economy of material and time in testing.

The value of tool wear is then plotted as one point on a graph of tool wear against cubic inches of metal removed, as shown in Fig. 3. Repeating this process will provide more graph points that will enable plotting the wear rate line.

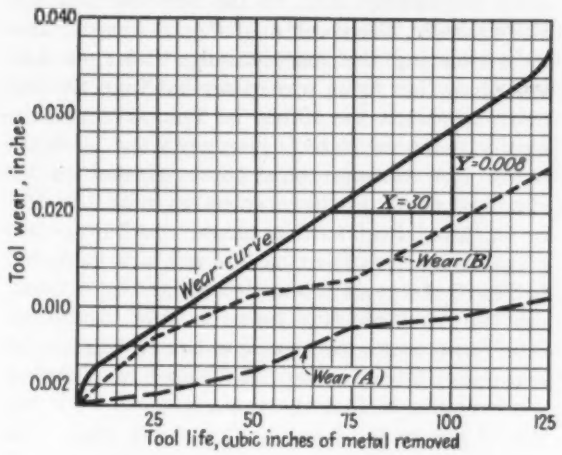


FIG. 3—How the wear curve is plotted. Amounts of wear shown as A and B in Fig. 1 are used to plot curves A and B. Their sum gives the straight-line wear curve, the slope of which is the wear rate.

In order to understand the basis of this procedure, it is necessary that tool wear be accurately defined. Fig. 1 shows the typical flank wear on a tool that has been used. Note that the cutting edge is lowered a distance, A, on the figure. This wear will occur at an irregular rate during the life of the tool, and sometimes will not be measurable during the early stages of tool use. The actual flank wear is shown as distance B on the sketch. Fig. 3 shows a graph of these two components, as well as their sum, C, for a typical tool test. Common test practice is to use the graph of wear B as the criterion of tool wear, and to determine the point where this equals 0.030 in. as the point where the tool requires regrinding. It is obvious that neither this line as drawn, nor one fitted to the test points, would be an accurate indicator of tool wear. However, if wear A is added to wear B and the result graphed, a line which is straight over a great portion of its length will result. Incidentally, this is true for all except a few materials, and for both milling and turning type operations. The curve at the lower end is accounted for by the fact that the first few moments of cutting produce an exaggerated tool wear. The curve at the upper end is explained by the fact that tool wear increases at a much faster rate near the point where total tool failure occurs.

The slope of the straight line portion of the curve represents the wear rate of the tool, and is expressed as the flank wear in inches for each cubic inch of metal removed. This wear rate is easily calculated from a graph of a test result by constructing a right triangle at some convenient place on the wear rate line as shown in Fig. 3, and dividing the wear by the cubic inches of metal removed. In the case shown on the graph:

$$m = \frac{Y}{X} = \frac{0.008}{30} = 0.000266$$

From this value, tool life for any selected flank wear, 0.030 in. for example, can be calculated by:

$$\text{Tool life in cu in.} = \frac{\text{tool wear}}{\text{tool wear rate}} = \frac{0.030}{0.000266} = 113 \text{ cu in.}$$

If it is desired to convert tool life measured in cubic inches to tool life in minutes, the tool life in cubic inches is divided by the metal removal rate in cubic inches per minute.

Because the above method is based on the slope of the wear rate line, a small error is introduced in failing to account for the wear between the origin and the wear rate line extended to the wear scale. But since this value of initial wear is fairly constant, and the important factor is the rate of tool wear, this error is of little practical significance.

The definition of machinability is taken as the ratio of cutting speeds with uniform tool life for the material being tested compared to a standard material. This ratio is most accurately determined by comparing the curves of speed against tool life of the tested and a standard material.

Five Factors In Tool Life

A speed-tool life curve can be plotted from a series of wear rate curves by solving for tool life and then plotting the calculated values of tool life as ordinates against the cutting speed for each test as abscissa. It is necessary to make a series of tests covering the range of cutting speeds that it is desired to have the curve include. Five points will normally provide sufficient data to construct a speed-tool life curve over the normal range of operating speeds. The curve representing the standard materials should be made first, and then the curve of the test material can be plotted on reproductions of the standard curve. Such a plot is shown in Fig. 4.

When curves are drawn, the machinability index is obtained by dividing the cutting speed of the test material by that of the standard material.

For example, from Fig. 4, the following values are obtained:

Metal Removed, cu in.	Machinability Index
50	0.745
100	0.735
200	0.765
300	0.740
400	0.730
	Average: 0.74

The machinability index in this case is taken as 0.74, which means that for a given set of con-

ditions the cutting speed for the test material could be set at 74 pct of that possible with the standard material, for equal tool life in both cases.

In the above graphs and calculations, tool life could be expressed in minutes or decimal hours with no change in final results. If the curves of Fig. 5 are plotted on semi-log graph paper, or log-log paper if time is expressed in minutes, they become straight lines. This fact provides a good check on the accuracy of the experiment. It also enables a speed-tool life curve to be constructed if only two test points are accurately determined, or even from only one test point if the slope of the curve is known. In the above table, the small variations between readings were caused by minor variations in the test procedure or in drawing the curve, so the machinability index can be considered as a constant, at least, over the normal range of cutting speeds.

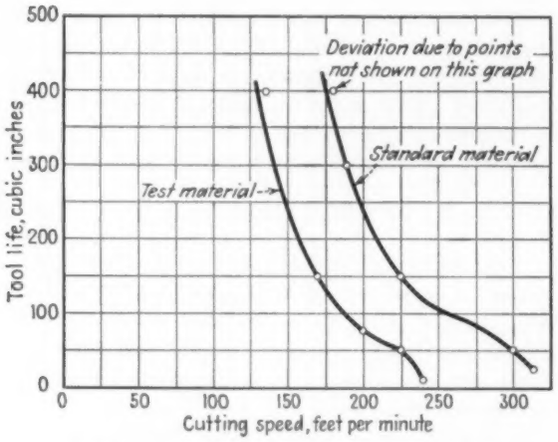


FIG. 4—Speed-tool life curves, with tool life expressed in cubic inches of metal removed in reaching a given amount of flank wear.

Because the machinability index is a constant, it is not necessary to perform the above procedure, since it is possible to make a determination of a machinability index with sufficient accuracy for shop purposes from one or two test points. This is the procedure normally used for routine machinability testing.

To perform a test in this manner it is only necessary to select a convenient point on the standard material curve. For example, in Fig. 5 the point where the curve intersected the 150-cu in. tool life line was selected, this point being at 225 fpm. It is necessary that the test be made at a speed that will give a value of tool life as close as possible to that selected from the standard curve. Since the relative machinability of a test material is usually approximately known or can be approximated by merely cutting a sample of the material in a lathe, to get a test speed that will fall in the range selected it is only necessary to multiply the standard speed by the approximate machinability index. Even if this estimate of machinability is in error, the test results will not be affected though it may in this case be necessary to run an extra test to get a graph point sufficiently close to the selected tool life. For example, the point A of Fig. 5 was obtained by estimating the machinability index as 0.80, and since this value was somewhat high the test point fell below the 150-cu in. line. The machinability index could have been obtained by drawing a line through this point parallel to the standard curve to its intersection with the 150-cu in. line. For more accurate results, another point above the 150-cu in. line would be required. In Fig. 5 the point B was determined by estimating the machinability index as 0.75, and since this value was somewhat low the test point fell above the 150-cu in. line. Drawing a line between these points to find the cutting speed at a tool life of 150 cu in. gave a value of 173 fpm. The machinability index was then determined by dividing 173 by 225, for a value of 0.77. Thus a sufficiently accurate value of machinability can be made in from 2 to 5 hr laboratory time.

The variation between the values of the machinability index of the two previous examples is common to what can be expected in practice. There are some variations in tool quality, tool grinding, lathe speed, and work material in even the best test setup. It is possible under ideal conditions to hold the accuracy of this type of test to ±1 pct, but such accuracy is attainable only with the most careful control. Normal care will provide results accurate within ± 3 pct, which is sufficiently accurate for all practical purposes.

Another distinct advantage of the microscope method is the fact that tests can be made at any

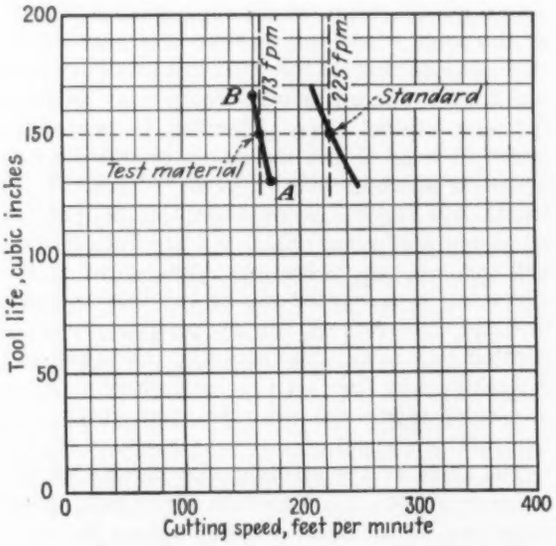


FIG. 5—Typical machinability index determination. Points A and B were obtained from assumed index values. The intersection of a line between A and B and the 150-cu in. line gives the cutting speed value used in determining the machinability index in this example.

desired speed; the use of high test speeds not being necessary. Thus it is possible to use test speeds in a range where more accuracy can be expected. More important, it is possible to make the test at the actual cutting speed to be used in the shop. For example, by conventional methods of testing with a high-speed steel tool on annealed medium carbon steel test material about 100 cu in. of material and 1 hr of laboratory time at a test speed of 90 fpm is required to complete one test. If, however, it were desired to make such a conventional test at a speed of 20 fpm, it would require about 30 laboratory hr and 4000 cu in. of test material. By contrast, the microscope method would require about 2 hr of laboratory time and 100 cu in. of material in each case. Since five tests are usually made to get an average value, the savings made possible by the microscope method are obvious.

Used For Any Machining Speed

Since with conventional methods a high test speed is usually used, shop people frequently say the test may be all right at 90 fpm, but the fastest this machine can run is 55 fpm. They may doubt that the test results apply at the speeds they must use. In such cases, the microscope method permits the test to be made at any desired actual operating speed without excessive expenditure of time or material.

In some cases of determining machinability such comments have merit. So far in this discussion it has been assumed that the speed-tool life curve from which the machinability indexes are determined are parallel. This is generally true for each class of materials, but is not necessarily true when comparing, for example, the machinability of a cast iron with a steel. When comparing the speed-tool life curve of a cast iron with a steel it may be found that the curves cross each other. In such a case, an average value of the machinability would be close to 1.00, the value at 45 fpm may be 0.95, and the value at 100 fpm may be 1.10. In such a case the only value that would be of any use would be one determined at the operating speed to be used. This condition is no fault of the method, being instead a characteristic of the materials. The same situation exists when comparing other classes of materials, for example, steel and aluminum, but the relative position of the curves is such that they do not cross within the normal operating range of speeds, and an average value of the machinability index obtained from such curves is sufficiently accurate.

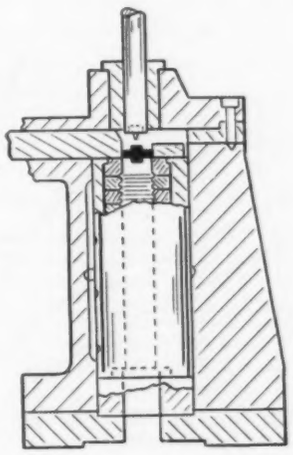
No mention has so far been made concerning the various details of tools, feeds, depths of cut and test equipment, as these details are common to routine tool testing procedure. However, it should be noted that the method applies whether high speed steel, cast alloy, or carbide tools are used. It is convenient to have curves for the standard material available for whatever tool materials may be used in routine testing. Theoretically, such a selection is not required because the machinability index is independent of the tool material. But in cases where it is desired to determine a machinability index on a material obtained with a particular tool under specific cutting conditions, it is desirable to have the means available for such tests.

Push Broach Speeds Small Gear Production

AN interesting approach to production of small toothed parts requiring high accuracy is shown in the accompanying illustration. Developed by Colonial Broach for making instrument gears, the operation consists of pushing the parts through stationary ring broaches.

Loading is done by placing the gear blank in the recess of a slide and manually pushing it into position below the ram of the press. No manual clamping is required, the blank being supported in the slide by spring loaded wedges. As the ram moves down, its arbor enters the bore of the gear blank to align it concentrically.

Shoulders on the ram contact the face of the blank and push it down through the stationary broaching rings. The parts drop out a chute at the completion of the cutting stroke. As soon as the ram has started the broaching stroke, the slide can be retracted and reloaded.



In one application, gears of ¾-in. pitch diam with 15 teeth are finished broached on a 6-ton, 35-in.-stroke Colonial Utility Press in a cycle time, including return of the ram, of 6½ sec.

Stainless Can Be Brazed for 2000° F Service

PART II.

THE principal alloy used in evaluation of brazed joints for high temperature service was Allegheny-Ludlum's S-590. This is a chromium-nickel-cobalt steel particularly adaptable to fabrication of highly-stressed parts operating at 1200° to 1600°F. It has suitable high temperature physical properties, and can be forged, or rolled into sheet form. This alloy was selected for the testing of brazed joints in the full range of modern aircraft gas turbine operating temperatures.

To expedite procurement, N-155 alloy was used in a few cases. This substitution did not introduce any new variables, since S-590 and N-155 have nearly identical short time physical properties and their chemical compositions are also similar.

Fig. 6 shows that the Colmonoy No. 6 butt brazed S-590 tensile strength compares very favorably with the base metal from room temperature through 2000°F. It may seem impossible that the brazed tensile specimen and the base metal should have nearly identical strength at 2000°F when the solidus temperature of the brazing alloy is only 1850°F. This is explained by the fact that the brazed joint is not made up of the brazing alloy, but of a new alloy formed by the solution of the base metal and brazing alloy. This alloy has a melting temperature approaching that of the base metal.

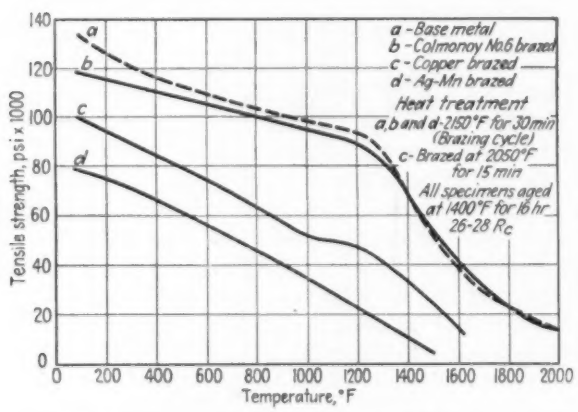


FIG. 6—Comparisons between the tensile strength at temperatures up to 2000°F of S-590 high-temperature alloy, and of specimens of S-590 butt brazed with three different brazing materials.

The data for the copper and silver manganese butt brazed S-590 specimens show much lower room temperature tensile strengths with the strengths dropping off with increasing temperature almost in a straight line to about 150°F below their melting temperature. The dip in the copper brazed specimen curve at 1000°F was unexpected and thought to be incorrect, but the shear data for copper joints showed a dip also at this temperature.

The butt tensile specimens brazed with copper and silver-manganese consistently failed through the brazing alloy while the Colmonoy No. 6 brazed specimens generally failed through the joint only up to 1600°F. Above 1600°F failures occurred both at the joint and in the parent metal.

Efficiency of each type of joint was calculated by taking the base metal ultimate tensile strength as 100 pct and comparing the ultimate tensile strength of the brazed specimens to it. The average strength of the Colmonoy No. 6 brazed specimens at 1600°F was above the base metal strength, giving 106 pct joint efficiency.

Since the consistency with which high joint strength could be obtained is of great importance, the high and low as well as the average ultimate tensile strengths were tabulated for each test temperature. The total range of strength for the six brazed specimens at room temperature was 4000 psi as compared to 5400 psi for the four base metal tensile specimens. Specimen uniformity at the other test temperatures also followed this same pattern. It is therefore apparent that the strength variation in the brazed specimens is not a result of nonuniformity of the brazed joints, but the result of a normal variation in tensile testing.

The 0.2 pct offset yield strength and the proportional limit data for Colmonoy No. 6 butt

Exhaustive tests show that joints brazed in dry hydrogen, with a special brazing alloy and S-590 as base metal, have suitable physical properties for 2000°F service. Tensile strength, yield strength and proportional limit are generally as high as the base metal physicals at high temperatures. Oxidation resistance is excellent.

By ROBERT L. PEASLEE, Supervisor, and WILLARD M. BOAM, Senior Metallurgist,
Fabrication Development Unit, Materials Laboratory,
Wright Aeronautical Corp., Wood-Ridge, N. J.

brazed S-590, shown in Fig. 7, compare favorably with the base metal. However, they do not show the customary hump in the curve at the aging temperature of 1400°F.

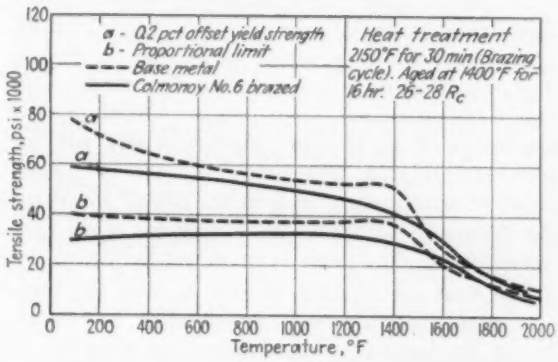


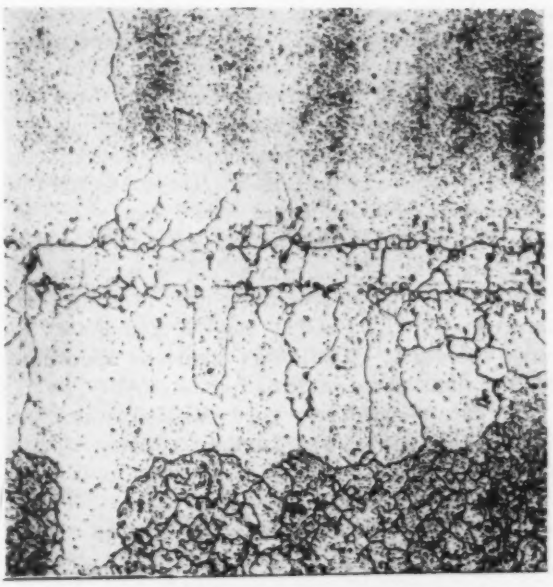
FIG. 7—Comparison between yield strength and proportional limit at various temperatures of S-590 alloy and of specimens of S-590 butt brazed with Colmonoy No. 6.

The elongation for the Colmonoy No. 6 butt brazed S-590 was found to be generally lower than for the base metal, particularly at 1600°F, where the base metal shows a sharp increase in ductility.

Tensile Specimens Failed Through Base Metal

The question arises as to exact location of the failure that occurs in the brazed joint area. For this information Colmonoy No. 6 brazed S-590 tensile specimens, tested to failure at room temperature, were cross-sectioned along the axis of the specimen and a micro specimen prepared. A similar micro specimen was also prepared from an as-brazed, or solution treated, tensile specimen. Fig. 8 shows photomicrographs of the two specimens.

The apparent joint thickness of the as-brazed specimens measures 0.002 in. thick and is surrounded by large columnar grains resulting from the brazing alloy diffusion in the base metal. The photomicrographs of the fully aged and tensile tested specimen shows a brazed joint width of 0.0015 in. surrounded by a narrow band



A, above B, below

FIG. 8—Photomicrographs at 100X of sections through the joint area of two S-590 specimens butt brazed with Colmonoy No. 6. Micro A shows the joint in the as-brazed condition. Micro B shows a joint after solution heat treating and aging for 16 hr at 1400°F, followed by a tensile test to failure. This micro clearly shows that failure was close to, but not through, the brazed joint. For A, etchant was Marble's reagent and for B, etchant was 10 pct HCl in alcohol.

of small grains. The brazing alloy diffusion has increased in depth and is now only discernible as partially formed grain boundaries. The ten-

sile failure, although appearing to the unaided eye as a brazed joint failure, actually failed through the grain boundaries of the band of readily discernible grains 0.002 to 0.004 in. away from the brazed joint.

The shear strength data of Colmonoy No. 6 brazed S-590 as measured by the double shear specimen are shown in Fig. 9. For comparison the shear strength of oxygen-free copper and silver-manganese brazed S-590 obtained with the same design shear specimen are also shown. It can be seen that the Colmonoy No. 6 brazed shear strength holds up very well through 1600°F.

The oxygen-free copper and silver-manganese brazed shear specimens show a pattern similar to the tensile data with the room temperature shear strength being lower than that of the Colmonoy No. 6 brazed specimen and dropping off in approximately a straight line which appears to be heading for zero strength at the melting temperature of each alloy. The curve for the oxygen-free copper brazed S-590 has a dip at 1000°F, similar to that noted in the butt tensile strength data. The original curve was plotted from data for three specimens each at room temperature, 800°F, 1200°F, 1400°F and 1600° F. Since the dip at 1200°F was felt to be abnormal, further data were obtained for the 1000°F point. These data showed very good uniformity but the dip in the curve was further accentuated as shown in Fig. 9.

Strength Ratios Used in Design

A useful design tool that may be obtained from the data thus far is the ratio of shear strength to the ultimate tensile strength. From a plot of the ultimate butt tensile strength and the shear strength for Colmonoy No. 6 brazed S-590 as well as the plot for silver-manganese butt tensile and shear strength, it was found that the ratio is approximately 0.34 for temperatures to 1200°F, then rises to 0.58 at 1600°F and gradually falls off again. One interesting point that these figures give is that the relatively hard Colmonoy No. 6 brazed joint and the soft silver-manganese brazed joint follow the same curve.

The specimen used for impact testing was of the Charpy notch keyhole type having the brazed joint at right angles to the axis of the specimen and through the center line of the hole. This specimen was used so that the base metal and the brazed joint would be given nearly equal stress for failure. The base metal curve showed the customary increase from 7 ft-lb at room temperature to 17 ft-lb at 1600°F. The brazed joint, on the other hand, gave nearly a straight line up to 1600°F, with the Colmonoy brazed S-590 having a strength of around 4 ft-lb and the oxygen-free copper brazed joint having a strength of approximately 2 ft-lb.

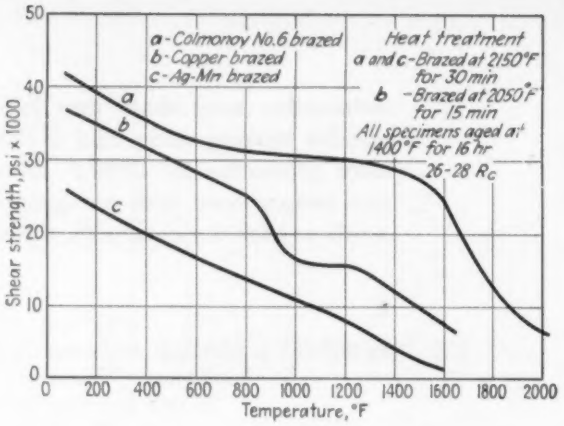

a-Colmonoy No.6 brazed
b-Copper brazed
c-Ag-Mn brazed
Heat treatment
a and c-Brazed at 2150°F for 30 min
b -Brazed at 2050°F for 15 min
All specimens aged at 1400°F for 16 hr
26-28 Rc
Shear strength, psi x 1000
Temperature, °F

FIG. 9—Shear strength of double-shear test specimens of S-590, brazed with Colmonoy No. 6, tested at temperatures up to 2000°F.

The short time tensile properties of oxygen-free copper and silver-manganese were fair, but it is known that these materials have notably poor oxidation resistance at higher temperatures. To evaluate their oxidation resistance as well as that of Colmonoy No. 6, a series of brazed standard 0.250-in. diam, 1-in. gage ASTM tensile specimens of S-590 were heated in still air for 48 hr at varying test temperatures. A second group of specimens was held at 1500°F for varying durations of time. All specimens were subsequently tensile tested at room temperature.

The first set of data, shown in Fig. 10, indicate that the stainless brazing alloy is not affected by holding temperatures up to 1500°F. Since the oxidation resistance of the brazing alloy is superior to that of the base metal, the authors feel that no adverse effect would be produced on the joint with holding temperatures up to 2000°F.

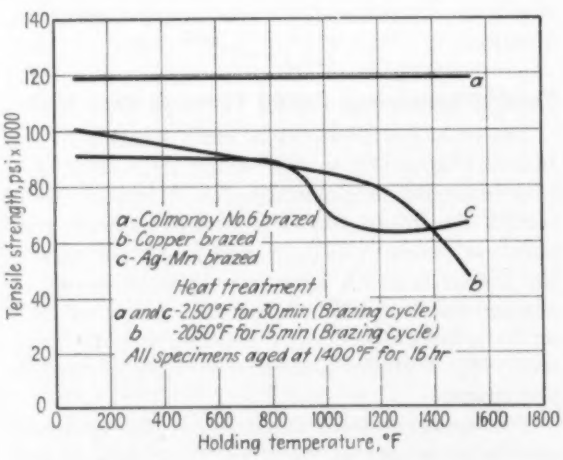

a-Colmonoy No.6 brazed
b-Copper brazed
c-Ag-Mn brazed
Heat treatment
a and c-2150°F for 30 min (Brazing cycle)
b -2050°F for 15 min (Brazing cycle)
All specimens aged at 1400°F for 16 hr
Tensile strength, psi x 1000
Holding temperature, °F

FIG. 10—Comparison between the relative oxidation resistance at various temperatures of S-590 joints brazed with various brazing materials. Test made by comparing tensile strengths after holding specimens at the temperatures, in still air for 48 hr prior to making tests at room temperature.

The second set of data indicated that a Colmonoy No. 6 brazed tensile specimen held at 1500°F up to 520 hr showed no decrease in room temperature properties. The oxygen-free copper brazed tensile specimens showed an increase in strength as a result of the aging heat treatment, but when subjected to treatment at 1500°F the room temperature strength dropped off rapidly with only 50 pct of its strength remaining after holding for 85 hr.

Joint Failures Occur In Center

The silver-manganese data were so spotty that no valid curve could be plotted, but the same general trend that existed for the copper-brazed joint was apparent. Both copper and silver-manganese curves showed a definite tendency of the alloys to show decreasing room-temperature strength after 85 hr at the holding temperature of 1500°F.

These data for copper and silver-manganese are only valid for classes of high alloy materials having similar oxidation characteristics to that of the S-590 alloy. As a result of the high oxidation properties of this base metal, all failures for the copper and silver-manganese brazing alloys occurred in the center of the brazing alloy joint. This mode of failure would not exist in low alloy materials, where failure would occur by the oxidation of the joint base metal.

The stress-rupture properties of Colmonoy No. 6 butt brazed joints were determined at 1500°F. The stress-rupture life was apparently slightly lower than that of the base metal. However, the comparison was made between stress rupture data for S-590 quenched in water from 2250°F, while the Colmonoy joint specimens were cooled in still air from 2150°F. The lower solution temperature and lower quenching rate for the brazed specimens were undoubtedly responsible to a great extent for the slightly unfavorable comparison.

Fatigue specimens of S-590, butt brazed with Colmonoy No. 6, were prepared in the manner described for the brazed tensile specimens. The test results showed an endurance limit at 10^8 cycles of 43,000 to 45,000 psi. The base metal showed a much higher endurance limit—up to 63,000 psi. The relatively low endurance limit of the brazed specimen is due primarily to the notch effect of the brazed joint.

Brazed Joints Pass Service Tests

One of the first turbine parts set up for dry hydrogen brazing was a stator shroud and blade assembly. This part previously had precision cast Stellite 21 blades plug welded to a 35 Ni-15 Cr sand casting. The welding of this part caused about 0.070 in. of distortion at the tips of the blades in spite of a heavy welding fixture. To meet the required blueprint tolerances of ±0.005 in. between the mounting flange and blade tips, it was necessary to go through an elaborate procedure for straightening the blades. At the time this assembly was set up for brazing, the silver-manganese alloy was being used. However, the noteworthy result was that these parts came from the 2100°F brazing cycle well within the tolerance requirement between the flange and blade tips. This was in part due to the use of plain carbon shim stock clips on either end of the assembly which held the blades in position during loading and relaxed completely at the temperature where differential expansion would upset the blade alignment. The finished assemblies brazed with silver-manganese in dry hydrogen and earlier assemblies brazed with Colmonoy No. 6 powder and flux performed satisfactorily in engines at metal operating temperatures at the joint of 1200° to 1400°F.

Blade Brazed into Solid Disk

Another part that was stainless brazed in dry hydrogen was a compressor rotor wheel made of precision cast AISI 431 blades and an AISI 431 forged hub. The blade butts were fitted into slots in the periphery of the disk, the stainless brazing alloy was placed on the end of the joint, and the wheel brazed in dry hydrogen. These wheels operated satisfactorily at their design speed of 12,000 rpm without difficulty.

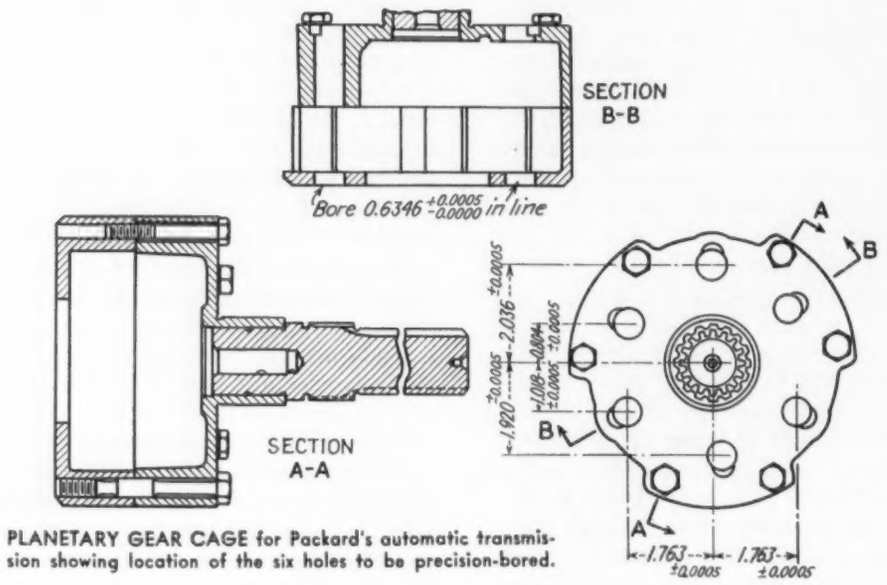
To obtain a better picture of what the actual brazed part would withstand, one wheel was obtained and prepared for whirl testing. This testing was done at room temperature in an evacuated chamber and consisted of holding the part at each speed level for 1 min. The wheel was whirled at 2000 rpm increments from 20,000 to 40,000 rpm, and then up in 1000 rpm increments. Failure occurred at 41,800 rpm through the hub. There was no primary brazed joint failure. As an indication of the approximate load on the wheel, a stress analysis was made for the 40,000 rpm speed. The results indicated a tangential rim stress of 72,000 psi and a maximum tangential hub stress of 195,000 psi, a stress above the ultimate tensile strength of the base metal. These calculations did not take into consideration the redistribution of stresses when the hub passed its yield strength.

These tests show that oxygen-free copper and the 85 pct silver-15 pct manganese as brazing alloys do not have suitable physical properties for service temperatures above 900°F. But the thorough testing did definitely indicate that Colmonoy No. 6 brazing alloy, when used with an appropriate base metal and brazed in a dry hydrogen atmosphere, gives a joint with satisfactory physical properties for applications through 2000°F. Stainless steel parts can be readily and economically fabricated by this method of brazing without scaling or the distortion and internal stress associated with most welded assemblies.

Packard Simplifies Tricky Boring Job

By GEORGE ELWERS, Machinery Editor, THE IRON AGE

Packard Motors precision bores six holes for planetary gear spindles in a cage scarcely 6 in. in diam, holding indexing error between any two holes to 0.001 in. A machine with two 3-spindle heads does the trick.



PLANETARY GEAR CAGE for Packard's automatic transmission showing location of the six holes to be precision-bored.

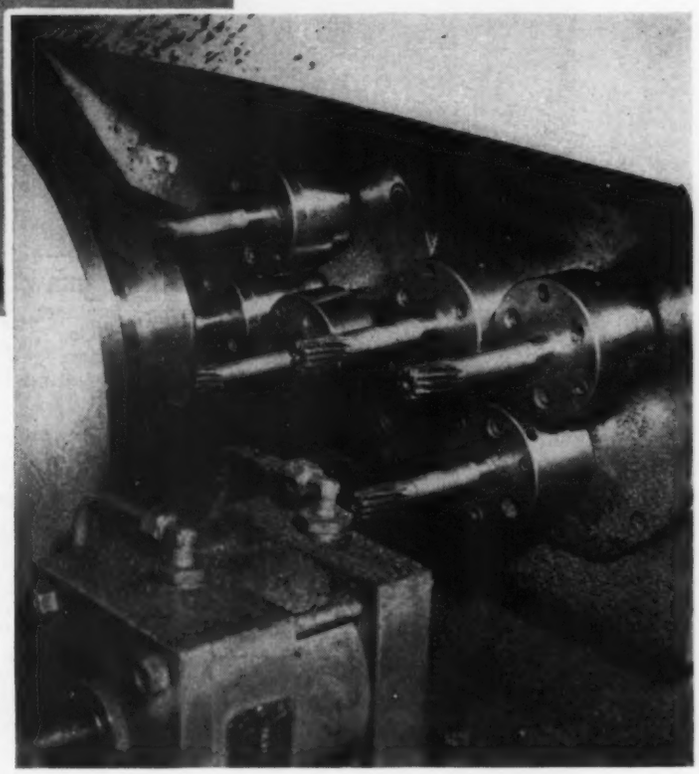
THE introduction of automatic transmissions has brought many new production problems to the automobile industry. The engineering department requires high precision, the sales department requires low cost. The production department is in between.

A typical problem is one solved at the Packard Motor Car Co. in machining a planetary gear cage for Packard's Ultramatic transmission. Into a cage scarcely 6 in. in diameter fits a train of eight gears, six of them planetary gears arranged in a circle around a central shaft. In such a train, normal tolerances in gear positioning are not good enough. A fairly liberal allowance might be made on the center distance between any two mating gears alone, but when each of these gears also mates with others in the train, increased accuracy on gear positions is required.. The penalty for too much variation in the location of the planetary gears would be the hogging by one gear of more than its share of load, resulting in unequal wear which would cause a noisy transmission at the least, and probably eventual breakdown.

In its perlitic malleable planetary cage, Packard bores six holes for the planetary pinions. Specifications read that the indexing error between *any* two of the holes—not just between adjacent holes—must not exceed 0.001 in. The tolerance on the horizontal or vertical distance between hole centers is 0.0005 in.

The ideal way to bore these holes would be to use a single machine with six spindles. But these holes are too close to each other—there'd be no room for the spindle bearings. So the conventional method for a job like this would utilize a single spindle machine, with the workpiece indexed from hole to hole.

LOCATION OF SIX SPINDLES, below, shows clearly in this view of the machine used to ream holes to size. This machine is identical with the one used for boring the holes.



BORING FIRST SET, above, of three holes with three-spindle head. When completed, fixture and table automatically index to permit head in foreground to bore remaining three holes.

That means either angular indexing under the single spindle, or indexing along a table under six separate single spindles. In either case, there is a lot of moving of the workpiece to be done, each movement contributing to the chance for error and inaccuracy.

So Packard has gone back to the multiple-spindle idea, and is boring the transmission planetary cages on a single machine having two sets of three spindles each, with only one indexing motion required—from one set of spindles to the other.

The machine used is a Model 27 New Britain precision boring machine, with special Parker Majestic spindles. The boring bars are of carbide, to eliminate any springiness, with inserted carbide cutting tools. The cage is held in a diaphragm-type fixture. The hub of the cage shaft has previously been ground on centers. The cage is then mounted in the boring machine fixture on a center at the shaft end, and in a diaphragm chuck at the ground hub. The fixture is mounted on a table which indexes automatically from a station before one three-spindle head to a position in front of the other. Micro-limit switches prevent feeding of the boring tools unless the table is up against the stop in either position.

In construction of the machine, 0.0003 in. tolerance was allowed between spindle center lines. Actually, five of the six spindles are less than 0.0001 in. from exact distance, and the sixth is only 0.0002 in. off.

Size tolerance of the holes is +0.0005, —0.0000 in. Some of the parts require a final reaming of the holes for size. This is done in an identical machine, with carbide reamers replacing the boring tools.

Modern Metal Finishing —A SCIENCE

By **HARVEY SHAW**
Finishing Engineer,
Coleman Co.,
Wichita, Kan.

Much of the art has been replaced by modern cleaning and finishing systems. Conveyerized handling through controlled atmosphere buildings and automatic processing cycles now produce a large tonnage of consistently finished parts. At Coleman, 55 pct of total finishing cost on a large heater is charged to processing. The actual cost of paint takes the rest.

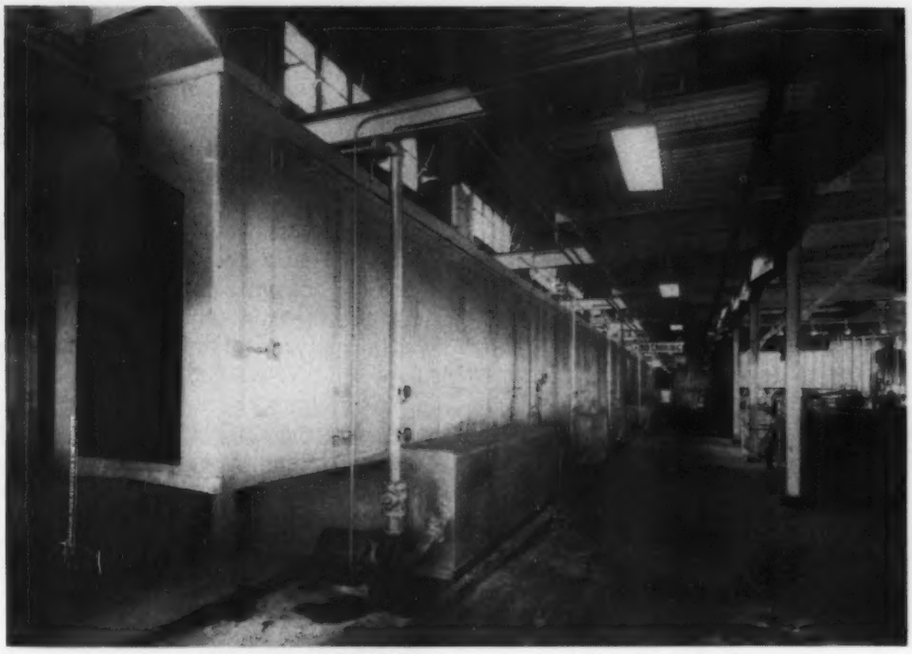
ONE of the most modern metal finishing lines in the country has been operating for 2 years at the Coleman Co., Inc., plant in Wichita, Kan. Engineered and built by the R. C. Mahon Co., Detroit, this $300,000 installation will clean and coat 5000 lb of steel per hr. The complete, self-housed finishing line is located in a two-story building 50x120 ft and handles all major heating appliance parts made by Coleman. Only 12 men are employed to run the entire finishing system.

On the top floor are located all the fans, blowers, ovens and air-mixing equipment. The controls for much of this equipment are also on the top floor; however, the entire system has a master control board on the ground floor.

On the ground floor is located the processing line, the cleaning, rust proofing and dry-off oven, all spray booths and the circulating paint system. Parts to be coated are divided into two types, spray-coated and dip-coated products. All parts are cleaned and processed in the same way, however.

The parts enter the processing line on an overhead monorail conveyer which transports all parts throughout the 6-stage processing system. In all, the Mahon installation uses 1500 ft of overhead conveyers which move at a constant speed of 12 fpm. The conveyer will support weights up to 100 lb per lineal foot.

The Coleman heater parts, mostly cabinet type, first go through an emulsion cleaner sprayed through nozzles which operate at 150° to 170°F. This tank recirculates 500 gpm of solution at 50 ft head pressure. The next tank rinses the parts in hot water under the same pressure pumped at a rate of 400 gpm. This is followed by a cold water rinse and then the parts are Bonderized. Coleman uses Parker Rust Proof Co.'s Bonderite No. 1000 at a temperature of 150°F. Rate of solution flow in this tank is 500 gpm at a 40 ft head. After Bonderizing, the parts are rinsed in cold

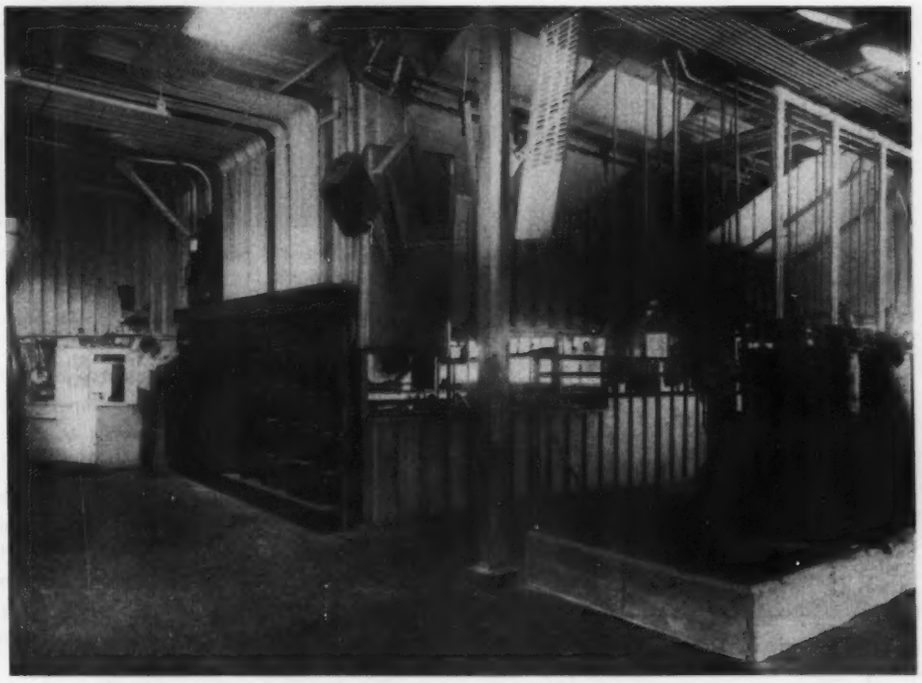


SIX-STAGE CLEANING and rustproofing line is but a part of the $300,000 metal finishing system at Coleman Co., Wichita, Kan.

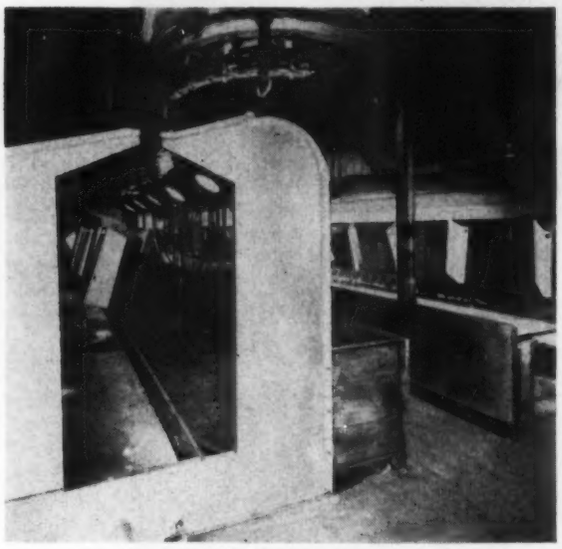
water and finally given a chromic acid rinse at a temperature of 120°F. A 10 pct chromic acid solution is used. About 325 gpm is recirculated in this stage of the process.

After leaving the cleaning line the conveyer takes the parts into the dry-off oven which is fired with natural gas and heated from 200° to 300°F to remove all moisture, and then allowed a cool-off period. Parts are now ready for the heat resisting aluminum base coat. Parts pass through a Hydro-Filter spray booth, and are coated inside with aluminum. Over-spray hits the water-curtain behind the parts which washes out the Al spray in the air. This over-spray Al paint sludge floats on top of the water tank at the bottom of the water curtain. This paint can be reclaimed. A soda compound, ¼ lb to each gallon of water, is used in the cleaning water to cause the paint to float and separate from the water.

The doors are assembled into the cabinets after leaving the aluminum spray booth and then conveyed directly into the 60 ft long second spray



CENTRAL CONTROL PANEL for the entire system is located on the ground floor. Paint circulating tanks for the large spray booths can be seen at the right.



ALUMINUM SPRAY BOOTH looking at the delivery end. From this 30 ft booth the parts are assembled and then finish-sprayed in a 60 ft booth.

booth. This booth is constructed like the first. Here the parts are sprayed base coat for color and if a hammered finish is desired, a solvent is spattered over the first color coat.

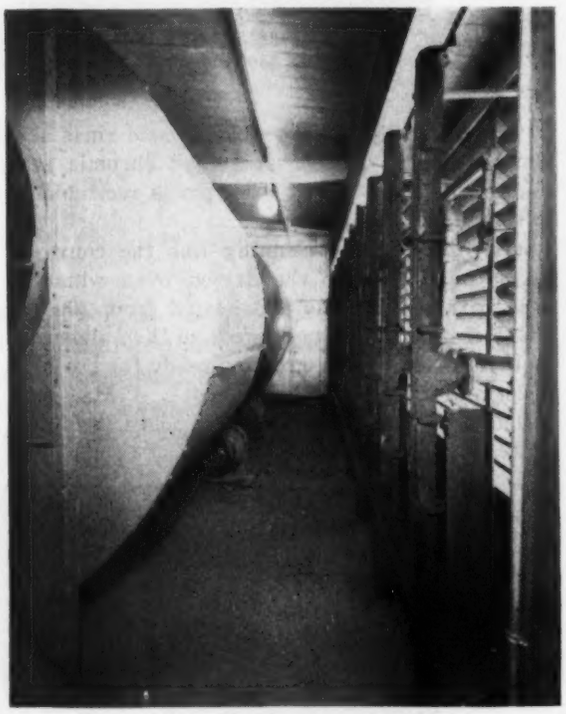
The paint used is of synthetic type. Paints are piped throughout the plant direct to where cabinets are sprayed at 25 to 30 psi circulating pressure. The pressure on these lines is maintained by geared pumps. Paint enters the spray gun where air under 75 to 85 psi atomizes the paint. Material pressure at the nozzle of the guns runs 10 to 15 psi. The circulating system is never turned off. Pumps run constantly regardless of whether plant is painting or not.

The solvent used for hammer finishes is handled by a system identical to the paint except the air pressure at the gun nozzle is around 12 psi.

ALL-METAL HOUSING of this finishing system is an important new development. The building is an integral part of the finishing system with no compromises due to headroom, columns, pipes and ducts normally encountered.

Hammer finishing is still an art and the type of hammer pattern is controlled by the solvent spray and the skill of the operator. Coleman regularly employs three types of hammer finishes, each of which has a special solvent for hammering. By assembling the entire exterior cabinet of the heaters before painting they are assured of a matching finish for each entire unit. Eight types of spray paint are used by Coleman but not all items are hammer finished. The colors are tailor-made by the paint supplier and a precise viscosity of the paint is maintained from start to finish by a Ford Viscosity Cup with a No. 4 orifice.

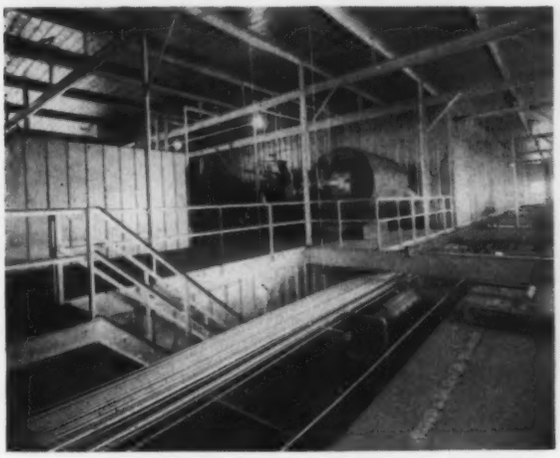
After spraying, the paint partially sets up before entering the baking oven. Usually 4 min is the maximum time for set-up. The conveyer weaves back and forth through the oven so that the parts traverse the length of the oven four times. Maximum temperature in the oven is 400°F and the parts are at this high tempera-



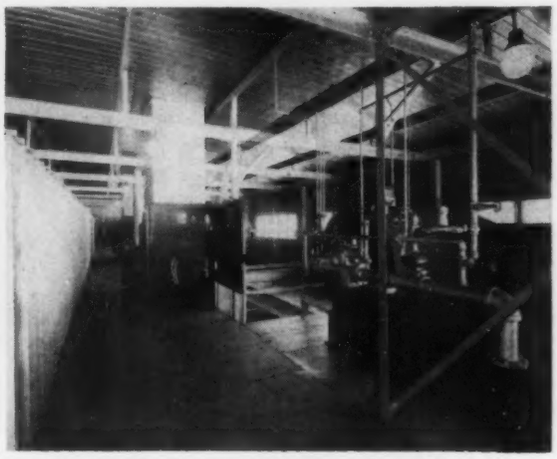
ALL THE AIR needed for heating and ventilation is drawn into the building past the vertical heaters at the right. Circulating fans are at the left. This system makes and maintains its own atmospheres.

ture about 7 min. Temperature is increased and decreased slowly as parts are moved into and out of the high temperature area; total time in the baking oven is 45 min.

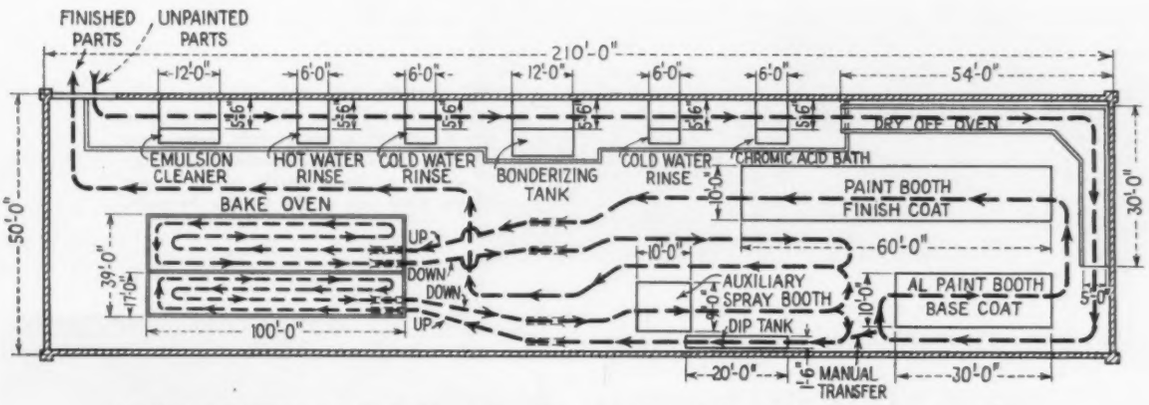
Specially built high temperature fans circulate the air through the ovens. Temperature is controlled by throttling-modulating burners. The total air supply for the entire system requires 110,000 cu ft of air per min. Air is also heated to about 70°F for the paint room, and this system can start with air as cold as —20°F. Maximum heating capacity of the air input system is 8,600,000 Btu.



SECOND STORY of the building houses the bake ovens and considerable other equipment. The top of the air processing system is shown in lower righthand corner. In the center is the injector type blower which automatically maintains the proper air:gas ratio in firing the ovens.



FUEL INPUT for the dry-off oven appears at the right. Controls for this unit are in the center. Just to the left of the controls is the exhaust fan for the 60 ft spray booth. All this equipment is on the second floor of the all-metal building.

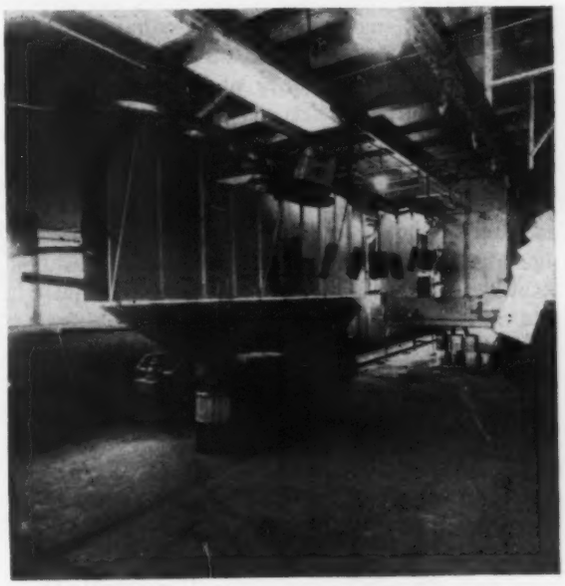


SCHEMATIC SKETCH of the finishing system. The ovens shown in lower left are on the second floor. All other equipment shown here is on the ground floor.

Parts not spray-coated are dipped and baked. These parts are transferred manually to the dip line conveyer after they emerge from the regular processing treatment. The dipping is automatic. The dip conveyer moves at 10 fpm. The slower speed permits proper draining of the parts and set-up of the paint. After dipping, the parts go through a bake oven and remain for 45 min.

Coleman dips three colors regularly. Green is baked at 300°F while the other two colors, brown and black, are baked at 450°F. The dip tanks hold 400 to 600 gal of mixed paint of proper viscosity. The paint is circulated and filtered through 0.005 in. holes in rotary disk filters. Each portable tank has its own pump and filter. Paint is recirculated at a rate of 2000 gal per hr. The pump is a gear type and delivers positive pressure. The paint is pumped from the bottom of the tank, circulated through the filters and delivered into the top part of the tank just below the surface of the paint.

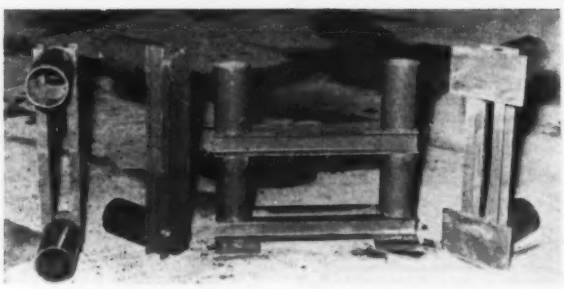
The portable tanks can be easily moved out of the line or replaced with a tank of different color paint. A track serves to locate the tank.



MOVABLE DIP TANK shown in place. Parts travel from left to right through this tank and on into the bake oven. The hood over the tank carries away the fumes.

Steel Warehouse Cuts Costs

WITH PORTABLE SECTIONAL RACKS



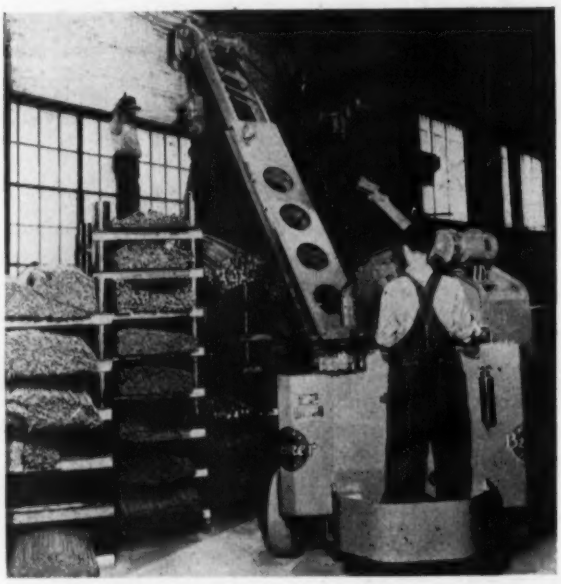
TWO BASIC UNITS, left, make up the racks. Both are made from 5½-in. ID pipe, and 3-in., 4.1-lb channels. Bottom sections, right, have base plates welded to them. Upper sections have, instead, disks welded to the channels, which fit into the tops of the pipe legs of the section beneath.

BY replacing permanent racks with home-made portable sectional racks, materials handling costs have been cut in half at Jones & Laughlin Steel Corp.'s Detroit warehouse.

Two different sections are used in building up up the racks. Base sections consist of two legs, base plates, and channel cross bars. Upper sections are the same, except that they have no base plates. All parts are rolled steel, fabricated by welding. They are sturdy and easy fitting, requiring no tools for setting up. The base pieces weigh about 60 lb each. The upper pieces each weigh 45 lb.

Since base pieces are not anchored to the floor, rack units may be located anywhere in the storage area, utilizing space to the best advantage. Racks can be set up and taken down as required, and moved or re-spaced to accommodate different lengths of stock according to changing storage requirements. When stock runs low, unused rack units may be stored in a small space and rack floor area put to other use.

An industrial crane truck is used in conjunction with the racks. Experience has shown that, because of the ease of removing and setting up racks, bottom tiers can be loaded and unloaded more economically by removing all material above them than by manually sliding material in and out the end of racks. Space requirements are cut, since it is practical to store stock in higher tiers.



CRANE TRUCK handles movement of material in and out of racks. To get at lower racks, material above them is removed. This is faster than manually sliding steel in and out of rack ends.

Prior to adopting the sectional racks and buying the crane truck, six or more men were used at this warehouse to pile steel and fill orders. The entire operation is now handled by three men, and the crane also has free time for additional use elsewhere.

FIG. 1—The controlled atmosphere melting furnace used in vanadium ingot production. The water-cooled copper mold is shown in place. The outer jacket which seals off the air from the argon inner atmosphere has been removed to show details.

PURE VANADIUM

NOW IN LIMITED PRODUCTION

Ductile vanadium, 99.8 pct pure, is now commercially available. Chips for remelting, as well as ingots and rolled forms, are in production. The metal can be rolled at ordinary temperatures and cold reductions up to 85 pct without annealing have been made. Vanadium machines well and is easily welded with conventional shielded arc methods.

THE high purity ductile vanadium recently made available by Electro Metallurgical Div. of Union Carbide & Carbon Corp. is melted in the furnace shown in Fig. 1. Vanadium chips are fed to an electric arc in an argon atmosphere and the metal solidifies in the water-cooled copper mold. In Fig. 2 the mold is removed showing the vanadium ingot as-cast.

The metal is workable at all temperatures from 2100°F down to room temperature. There is no phase change and hence no range of temperature below 2100°F at which the metal cannot be worked. The chips are made from massive vanadium, the first product after the refining of the raw material-vanadium oxide.

Electro Metallurgical has produced the ductile vanadium in rolled form. Some of the fabricated products are shown in Fig. 3. A representative analysis of the metal is shown in Table 1. Room temperature properties in the annealed and cold-reduced form are shown in Table II. The pure metal does not have high strength at temperatures over 400°F.

Melting of the metal is very similar to that of

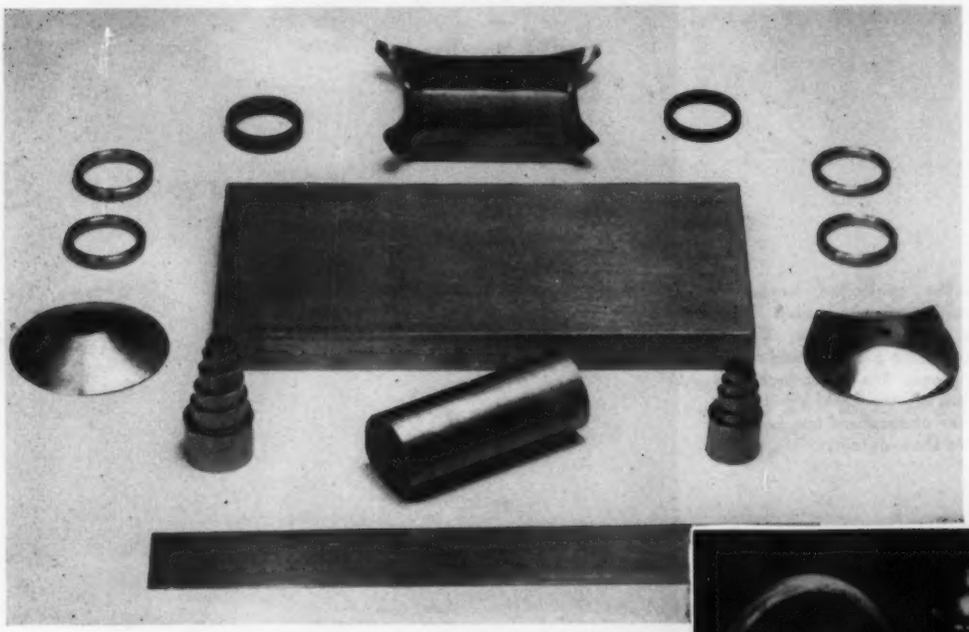


FIG. 3—Products other than ingots are available. Some of the parts fabricated from ductile vanadium are the conical-helical spring, rings, tubes and Belleville-type springs shown above.

FIG. 2—The water-cooled mold in Fig. 1 has been removed and the vanadium ingot is shown in the as-cast condition. The arc electrode is in position atop the ingot.

titanium. Vanadium is even more active in combining with the common gases. In rolling it is often necessary to sheath vanadium inside a stainless steel wrapper to exclude air contamination.

Pure vanadium has good corrosion resistance and excellent ductility in the annealed condition. In this respect it resembles tungsten. Like tungsten, vanadium is not readily cold workable in the equiaxed grain structure condition. In the elongated grain condition, the ductility of vanadium is excellent and 0.020-in. thick sheet can be bent flat on itself with no cracking at the radius of the bend.

The metal has a modulus of 22 million psi, and a density of 6.1. The ratio of modulus-density is almost the same as steel, 3.7 million. This favorable strength-weight ratio produces vanadium parts with high flexural rigidity. The metal is resistant to marine conditions and is suitable for stressed parts in marine atmospheres.

Vanadium is easily machined and cuts better than Monel, nickel, 18-8 stainless and titanium. Cold reductions as high as 85 pct have been made without annealing. After 85 pct reduction, the hardness runs RB 90 to 100. Vanadium can be welded with conventional shielded arc methods.

Massive vanadium, the material used for melting, is obtainable in chip form at $30 a lb in the relatively small amounts now in demand. The ingot form costs somewhat more. Alloys of the metal are not now available but are expected to be in the near future. Commercial applications of the metal are not definitely established as yet.

TABLE I

ANALYSIS

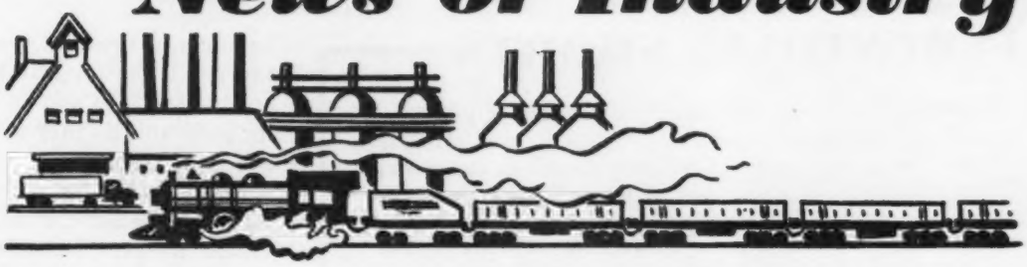
Oxygen	0.05 to 0.12
Hydrogen	0.001 to 0.004
Nitrogen	0.02 to 0.04
Carbon	0.03 to 0.07
Vanadium	99.9 to 99.8

TABLE II

MECHANICAL PROPERTIES

	Yield strength, psi	Tensile strength, psi	Elong. in 2 in., pct	Hardness
Annealed 1 hr at 1500°F	76,000	81,000	7	RB 76
Cold reduced 85 pct	142,000	155,000	1 to 2.5	RC 29

News of Industry



More Steel Capacity

Washington—The steel industry has stepped up its expansion plans to add almost 9.4 million net tons to its steel capacity by the end of 1952. From 100,563,500 net tons on July 1, 1950, steelmaking capacity will move to 109,963,000 net tons by the end of 1952, according to present plans. Blast furnace capacity will be increased by 1,734,000 net tons to 73,378,000 tons during the same period. These figures were given to Secretary of Commerce Charles Sawyer by the American Iron & Steel Institute last week in response to a government request.

Streed to Open New Plant

Gadsden, Ala.—A steel fabricating plant in a building near this city will be opened by the Streed Fabricating Co. as soon as equipment can be moved from Montgomery, Ala., where the firm's main business is located.

Urge Mills Make Light Sections

Chicago—Small mills can best aid the war effort by producing light weight special sections, it was emphasized at the Rail Steel Bar Assn. meeting recently. Shipments of high strength steel sections other than reinforcing bars and carbon bars has increased 47 pct over 1949 shipments.

Auto Parts Firms Merge

Detroit—Two firms manufacturing automobile parts, Thompson Products, Inc., and Perfect Circle Corp., Hagerstown, Md., have merged.

STEEL MARKET—Bureaucracy Breeds Chaos

Troops of task committees, expediters, fakers, etc., will bring confusion . . . Worst is yet to come . . . It's growing pains with politicians in saddle—*By Tom C. Campbell.*

New York—"There'll be a hot time in the old town tonight" is mild to what will happen soon in the steel market. Most steel salesmen and their customers think this week that things have gone beyond the hectic stage. But they haven't seen anything yet.

Soon there will be task committees, priorities, expediters, fakers, war orders, defense orders, indirect defense orders, walking delegations and anything and everything to make utter confusion. This is no by play. It is the consensus of people who know—both in and out of Washington.

We are going to go through the same pains we did before and during the last war. But with this difference: The politicians are in control in Washington. Steel people and government people who want to do a fast and good job just can't do it—yet. Maybe later it will be their job to do just that after the floundering around gets us in a jam.

Things Look Bad

As to the small steel users and even the big ones who use steel for purposes that won't fit into the war or defense scheme, things look bad. Major programs have been laid out by Washington authorities who will see that armament, defense and indirect defense items big enough to be a major program will get a task force of steel people to expedite them. This force will be veteran steel men. They will add up the requirements, see that the load is distributed properly among steel firms, and put the heat on to get things rolling.

There will be only one priority —"DO" (defense order). But there is no clear provision to determine which order comes first, middle or last. There will be the rub that sooner or later will become a cancer. To further confuse matters the priority now applies only to military material.

The whole thing will be voluntary to this extent: The steel task force will decide which mill gets how much of what program. Then the mill does its part. It will be mandatory to the extent that those orders carrying a priority must be filled ahead of non-priority orders.

Story on NPA giving production priority to military orders appears on p. 104.

Most of the programs handled by the steel task force will require much flat-rolled steel. The allocation of the orders will be subject to a lot of argument by the various companies. But it is expected that they will have to take what is assigned to them.

If only the major programs were involved, things would not be on their way to the most confusing state in steel history. Besides the priority major programs there will

INDUSTRIAL SHORTS

FREE INSTRUCTION — EUTECTIC WELDING ALLOYS CORP., New York, has announced that enrollment in the Eutectic Welding Institute at the company's plant in Flushing, L. I., is being extended without charge to employees of government agencies and to members of the Armed Services.

BUYS CONTROL—E. R. Standfuss, formerly general manager of Shunk Mfg. Co., Bucyrus, Ohio, has purchased controlling interest in the BURCH CORP., Crestline, Ohio, manufacturers of road building machinery and dump bodies for trucks. Mr. Standfuss has been named president.

NMTA OFFICERS — Joseph L. Kopf, president of Jabez Burns & Sons, Inc., New York, was elected president of the NATIONAL METAL TRADES ASSN. Philip M. Morgan, president, Morgan Construction Co., Worcester, was named first vice-president and Charles S. Craigmile, president, Belden Mfg. Co., Chicago, second vice-president and treasurer.

BUILDING HARBOR—On the Monongahela River near Courtney, Pa., PITTSBURGH CONSOLIDATION COAL CO. will build a 1455-ft harbor for loading coal barges by conveyor belt directly from the mine.

NEW HEADQUARTERS—New sales and service headquarters have been opened at 3014-16 Olive St., St. Louis, by the JOHN J. CONNELL CO., St. Louis area representative for the Automatic Transportation Co., Chicago, manufacturer of Automatic Skylift and Transporter electric industrial trucks.

HEADS CAR GROUP—Charles W. Wright, president of Pullman-Standard Car Export Corp., New York, has been elected president of the AMERICAN RAILWAY CAR INSTITUTE. Mr. Wright succeeds Samuel M. Felton, who has resigned to accept the presidency of Shippers Car Line Corp.

BRITISH MILL OPENS — NORTHERN ALUMINUM CO.'S new $4 million continuous hot strip mill at Rogerstone, Monmouthshire, England, is now in production. Officials believe that 75 pct of production will be available for export.

EXPANDS FACILITIES — QUAKER CHEMICAL PRODUCTS CORP. will build a new boiler house and install new boilers at their Conshohocken, Pa., plant. This expansion will give the company almost three times the boiler capacity now available.

DISTRICT OFFICE—A central division sales office has been opened in Cincinnati by the NICHOLS WIRE & ALUMINUM CO., Davenport, Iowa. Joseph H. Luebbe has been appointed district manager of the territory which includes Ohio, Pennsylvania, West Virginia, Kentucky, Tennessee, Indiana and Michigan.

MORE PIPE—The property occupied by the Colonial Industries in Bessemer, Ala., has been taken over by the T. C. KING PIPE & FOUNDRY CO., Anniston, Ala., manufacturers of soil pipe. Operations will start within 2 weeks.

ACQUISITION — Taylor Machine Co., Cleveland gear producers has been acquired by the ARO EQUIPMENT CO., Bryan, Ohio. Part of the Aro aircraft accessories will be made in the two Taylor plants which will be known as the Aro Equipment Corp. Aircraft Div. James P. Johnson, formerly an Aro executive, has been named a vice-president in charge of the Aircraft Div.

WEST COAST SALES—The W. W. Sly Mfg. Co., Cleveland, has appointed the HORRELL CO. of 8006 Melrose Ave., Los Angeles, to act as sales engineers for their line of industrial dust control and sandblast equipment.

be one and two-shot orders which are not to be programmed. They are too small to add up to a regular program. So they will be taken one at a time.

A one-shot defense order covers material needed for smaller individual needs. Examples of this would be so many cranes; or an order for parts to modify tanks; or an order for defense material that would not be repeated to that firm. These orders which do not come under a program will run into the thousands before the defense program is finished.

Trouble at Crossroads

Before that time most steel people will be finished too. The reason? Such one-time orders will have a priority that must be honored by the steel firm presented with them. Not to do so would court trouble. But there will be no way to tell for sure if they are the only ones filling such an order or whether other steel firms will be in on the order. All this means that there will be trouble at the crossroads. By the time the defense orders are rolling in big tonnages the stage will be set for a modified controlled materials plan.

The official Washington reason for no CMP at this time will be that it takes too long to be completed before November elections. But it is coming and the framework will be built up as the confusion builds up.

Dave Carson, vice-president of Sharon Steel Corp., will head up the steel division in Washington. He is an old hand at knowing which steel firms make what. His value will be to know where to go for how much and what kind of steel products. His assistants, subject to consultation, will be men from three other steel firms, U. S. Steel, Bethlehem and Republic Steel.

Award $8 Million Jets Contract

Boston—Defense contract spending after the outbreak of war in Korea totalled more than $58 million in New England and the tempo of defense spending is on the upswing averaging slightly less than

$5 million weekly, reports the New England Council. Largest of recent contracts, $8 million, was awarded to Pratt & Whitney, East Hartford, Conn., for turbo jet engines and their development.

Birmingham Coke Production Will Jump 25 Pct with New Ovens

Birmingham — Coke production will increase approximately 25 pct upon completion of 59 new ovens planned by Sloss-Sheffield Steel & Iron Co. and the Alabama By-Products Co.

Sloss-Sheffield will add 30 ovens to bring its total to 150 ovens producing 70,000 tons of coke per month. Sloss-Sheffield is now building a new research laboratory, a new turbo-blower and new steam-generating equipment. Cost of the expansion program is in excess of $3.5 million.

Alabama By-Products Co. will add a battery of 29 coke ovens at its Tarrant works.

Strike Sees Steel Industry Dispersal as Serving Defense

Cleveland—New England put in its bid for any future steel expansion to meet defense needs through spokesman Clifford S. Strike, president of the New England Steel Development Corp., at the 1950 convention of the Assn. of Iron and Steel Engineers last week.

Citing new steel plants in Utah, California, Texas, and elsewhere, Mr. Strike commended "dispersal of our steel industry" as strengthening national defense and economic advantage in marketing. He said that the proposed New England steel mill will be built more quickly because of the Korean war and defense needs.

"New England is the largest area in the U. S. that does not possess one or more integrated steel plants," he continued. "New England steel users must have a local source of steel or suffer high costs and uncertain supplies." He stressed that the source of iron ore was shifting toward the Atlantic basin.

IN AND OUTGOING: The two new top men of the AISE and the incumbent president are shown left to right: John F. Black, president for '51; I. N. Tull, first vice-president; and A. S. Glosbrenner, incumbent president.

AISE SHOW—Exhibits, Papers, and Worry

More than 10,000 attend Cleveland meeting . . . Unofficial talks show tenor of worry at government planning for industry . . . Show self-centering roll—*By D. I. Brown.*

Cleveland—A record crowd attended the annual meeting of the Assn. of Iron and Steel Engineers held here last week. Over 40 technical papers were delivered at the 4-day show. Exhibits of the latest steel mill and industrial equipment attracted the attention of the 10,000 to 12,000 persons who visited the convention.

In the countless unofficial conversations of members was a weighty undertone of bewilderment and frustration at the indecision and reluctance of the government to set a clear path for industry to follow in meeting international dangers by production.

Self-Centering Roll

One of the exhibits, high on the interest list, was the U. S. Steel Corp. booth which featured the Lorig self-centering roll (THE IRON AGE, Sept. 21, 1950, p. 102). Mr. E. T. Lorig of Carnegie-Illinois Steel Corp. presented a full technical paper on the new device during the mechanical session held on Tuesday, Sept. 26. The split roll design will automatically convey strip down run out tables or through processing lines without the usual guides. Lorig rolls are self-centering and can be used as pulleys for endless belts or a host of other applications.

Lubrication, combustion and electrical sessions featured the new developments in both new equipment and maintenance. The general sessions were well attended. Among the papers presented were "The Proposed New England Steel Plant," by Clifford S. Strike, president, F. H. McGraw & Co.; and "Engineering and Purchases," by Thomas D. Jolly, vice-president of engineering and purchasing of the Aluminum Co. of America.

"Inventory Time" Paper

An inspection trip to the Lorain Works of National Tube Co. attracted about 1000 visitors. The trip was held on Wednesday afternoon and followed a paper given that morning by John L. Young, vice-president in charge of engineering, National Tube Co. H. B. Jordan, president of American Steel & Wire Co., another U. S. subsidiary, addressed the formal dinner on Thursday evening. His talk, "Inventory Time," stressed the need of still greater service of the industry to our nation and our friends.

The real talk, the man-to-man conviction stuff on the floor of the show, in the hotel foyers and over the tables indicated that many of the engineers were preoccupied. In many cases a sense of frustration pervaded the atmosphere. Frustration not against tough deliveries, hard-to-get materials, black market prices, taxes — but frustration because of the lack of direction, the present road blocks

of indecision by a government possessing the greatest industrial team ever assembled.

The engineers had the utmost confidence in themselves, their companies and their products. The exhibit halls were packed with the latest industrial equipment to prove it. No one had to brag how good they were. There it was. See for yourself.

What's to be Done?

All they wanted to know was how best to use the equipment, how they could best serve in what they believe is a very hot, a very serious war. They are ready and able to tool up for anything. They can do it overnight if need be—but what shall we tool up to do?

Mr. Jordan's talk "Inventory Time," came closer to the subject than any other. But many of the assembly had beaten him to the punch. They had taken it. They knew where they stood. They are waiting for Washington to tell them where they stand.

New officers for 1951 were elected at the business meeting. John F. Black, the new president, is asst. general superintendent of Youngstown Sheet & Tube Co. at Indiana Harbor. He succeeds A. S. Glossbrenner, vice-president in charge of operations of the Youngstown Sheet & Tube Co., as leader of the association for the next year. I. N. Tull, electrical superintendent of the Republic Steel Co., Cleveland, was elected first vice-president of the AISE for 1951. Other new officers of the association are: second vice-president, J. L. Young, E. L. Anderson and John E. Vohr.

NPA Order Sets Defense Production Priority

Ore, scrap, fuel excluded . . . "DO" ratings will be given by Defense Dept. agencies, Atomic Commission . . . Mills directed to give precedence to rated over unrated orders.

Washington—A broad system of production priorities, giving equal precedence to all defense orders, was put into effect this week by the National Production Authority.

The priorities set-up, effective Oct. 3, applies to virtually all defense and atomic energy procurement. Only a handful of commodities and services, such as ore, scrap, foods, fuel and electric power are excluded.

The NPA order prescribes a single — "defense order" — rating band with no degree of preference. The actual issuance of the "DO" ratings will be carried out by the procurement services of the Defense Dept. and the Atomic Energy Commission. Requests for rating of an order should be directed to the contracting offices of those departments, NPA said.

A steel mill or other producing firm that has received rated orders must schedule operations to fill, as far as possible, each rated order by the required delivery or performance date. If this is not possible, the mill must give preference to all rated orders over unrated orders.

When conflicting rated orders are received by any producer, precedence must be given to the order received first, but orders received before Oct. 3 and which receive ratings prior to Oct. 18 take precedent as of the dates on which orders were first placed.

When conflicting rated orders are received on the same date, precedence must be given by the mill to the order which has the earliest required delivery or performance date.

A rated order calling for earlier delivery than a rated order already accepted must not be allowed to interfere with scheduled delivery on the first order. But if both deliveries can be made on schedule it is not necessary to produce or make delivery on the first customer's order ahead of the second.

NPA said that in the "usual case," the date on which specifications have been furnished to the manufacturer in sufficient detail for production is considered the date on which the rated order is received.

Needn't Stop Immediately

If a rated order or a rating applicable to an order is cancelled when the supplier has material in production to fill it, he need not immediately stop processing in order to put other rated orders into production. NPA said he may continue to process the material which he had put into production for the cancelled order to "a stage of completion which will avoid a substantial loss of total production." But he may not incorporate any material which he needs to fill any rated orders on hand, and he may not delay putting other rated orders into production for more than 15 days.

The ratings may be extended for material in most cases. When a person has received a rated order for the delivery of material, he may extend it to get the material which he will deliver, or which will be physically incorporated in the material which he will deliver, including containers and packaging materials required to make the delivery, and including any chemicals directly used in production.

If a person has made delivery of material or has incorporated it into the material which he has delivered on a rated order, he may extend the rating to replace it in his inventory subject to NPA's regulations governing inventories.

As far as applying or extending the ratings is concerned, the producer must put the "DO" and the two digits supplied to him—for example, DO-39—on his purchase order or on a separate piece of paper attached to the order or clearly identifying it, together

with the words "certified under NPA Reg. 2" and signed by the person placing the order.

William H. Harrison, NPA administrator, hinted this week that his agency is considering extending the new priority system to other than defense orders.

"While the application of the rating system is confined at the outset to direct defense procurement, we are mindful that there are many activities in direct support of the defense program which call for materials in limited supply," Harrison explained. "Measures are being considered to handle this kind of situation.'"

Washington Moves on Faster Depreciation

Anyone with war orders may use 5-year plan . . . Need not directly make tanks, guns, etc. . . . White House studying administration of act . . . World War II setup to be model.

Washington — The government moved this week to provide for accelerated depreciation of plant and equipment.

White House tax experts are studying the new revenue law enacted by Congress recently to decide just how they will administer the provision for faster "write-offs" of emergency facilities. It is expected that an executive order to be issued soon will name a government agency—not the Treasury Dept.—to administer the depreciation law and to issue certificates of necessity to individuals or corporations applying for this tax relief. Administration of the law is expected to be much the same as during World War II.

Any Defense Plant Eligible

The certificates of necessity will be available to any businessman who chooses to elect the 5-year depreciation avenue of accounting. Generally speaking, anyone who wishes to take advantage of the provision should apply to the government agency issuing the certificates. The applicant will be required to show only that he is engaged in production or manufacturing connected with defense work.

He need not be directly engaged in the manufacture of tanks or guns, for example. The only requirement is that his plant or his machinery is directly or indirectly involved in defense production. However, the plant or facilities for which the tax relief is sought must have been constructed or acquired after Dec. 31, 1950.

Congressman Doughton, D., N.C., in explaining the new law to members of the House, pointed out that the determination of whether or not a facility is attributable to "defense purposes" rests with the government.

The amortization deduction may be taken at the election of the taxpayer, he said, in lieu of depreciation, and may be discontinued (and depreciation resumed) before the expiration of the 5-year period.

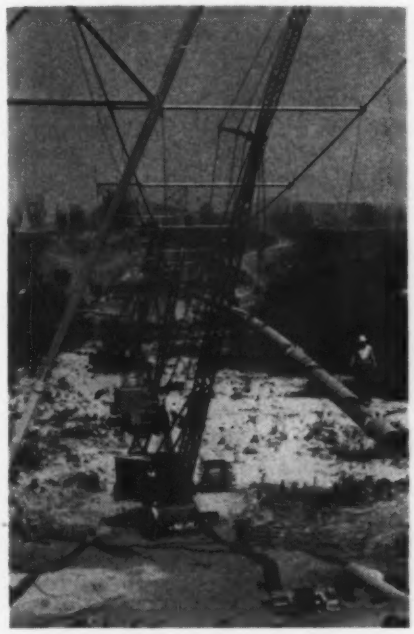
However, the new law does provide that any gain from the sale or exchange of property, to the extent that the adjusted basis of such property is less than its adjusted basis determined without regard to accelerated depreciation, shall be considered as ordinary income. As an example of the workings of this provision, Mr. Doughton cites the following hypothetical case:

"For example, on Dec. 31, 1950, a taxpayer making his income-tax returns on the calendar-year basis acquires at a cost of $10,000 an emergency facility (used in his business) which normally would have a useful life of 20 years.

"Under Section 124A (the section of the new tax law providing the faster write-offs) he elects to begin the 60-month amortization period of Jan. 1, 1951. He takes amortization deductions in the amount of $4000 for the years 1951 and 1952 (24 months).

"On Dec. 31, 1952, he sells the facility for $9500. The adjusted basis of the facility on that date is $6000 ($10,000 cost less $4000 amortization). Without regard to Section 124A, the facility would have been depreciated at the rate of $500 a year, and its adjusted basis on Dec. 31, 1952, would have been $9000 ($10,000 cost less $1000 depreciation).

"The difference between the facility's actual adjusted basis ($6000), and its adjusted basis determined without regard to Section 124A ($9000) is $3000. Accordingly, of the $3500 gain on the sale of the facility ($9500 sale price less $6000 adjusted basis) $3000 would be treated as ordinary income and $500 as long-term capital gain."



OVERHEAD PIPE: Consolidated Western Steel Corp. workmen hang pipe across the largest suspension pipeline bridge in Southern California. It spans the Santa Ana River, near Riverside, and is the final link in the new Texas to California natural gas loop line of the Southern California Gas Co.

Can Production 14 Pct Over '49

New York—Can production increased about 14 pct for the first half of 1950 over a comparable period for 1949, said L. W. Graaskamp, vice-president of American Can Co. Fruit and vegetable cans, including juice cans, showed the largest increase with 3,090,000,000 units produced during the first half of the year, compared with 2,725,000,000 made during the same period in 1949.

Canada Blocks Nonferrous Exports

Ottawa—Extension of export controls, especially nonferrous metals used in production of war goods, has been announced in a move designed to block the flow of Canadian goods to the Soviet orbit. Copper, lead, aluminum, brass, bronze, nickel, zinc, glycerine, benzine, soda ash and nylon are among the items which will now require export permits.

NMTA's Clarke Tells of DPA Obscurities at 51st Convention

Sees act as not guaranteeing fair wage fixing with price controls.

New York—Metal manufacturers were apprised of the many things they must think about now that industry is in an initial chaotic state concerning its role in defense production while Washington remains obscure. They met for 3 days last week at the fifty-first annual convention of the National Metal Trades Assn. in the Hotel Commodore.

David R. Clarke, NMTA general counsel, in discussing the Defense Production Act, said that the law does not ensure that sound wage controls will be instituted to complement price fixing. Mr. Clarke cited Section 402 b 3 of the act which declares that the President must stabilize wages whenever price ceilings are instituted. He pointed out that Section 402 b 5 gives the President power to prohibit wage hikes when they might push up price ceilings or work hardship on a producer under controls.

Wooing of Labor?

In effect, the President is given broad powers in deciding if wage rises can be given and whether an employer can bear a wage rise. Some present feared that wooing of the labor vote might make the administration bend over backward as union appeasers.

Although inventory control orders regulated the accumulation of inventories by legitimate businesses, the DPA had overlooked the resale of scarce goods at black market prices, claimed Mr. Clarke. He also advised industry to be wary of permitting too big a spread between costs and selling price. The inclination to raise prices and compensate for loss of business volume caused by shortages may not be regarded as justifiable by the President.

Other speakers reported on skilled labor shortages and some opined that the shortage would grow in proportions. P. W. Morgan, president of the Morgan Construction Co., said that he could use another 50 draughtsmen to help fill a year's backlog on rolling mills. Maj. Gen. Lewis B. Hershey, Selective Service Director, suggested that industry refrain from trying to keep employees in the 19 to 25 year old group out of the draft.

Alfred Edwards, expelled from the British Labor party because he was against steel industry nationalization, declared that, if the Iron and Steel Act is fulfilled, it will be because extremists control the government and some might work more closely with Russia than the U. S. He predicted that the Labor party will not nationalize steel this January despite its slim victory in Parliament.

Hugh H. Clegg, of the Federal Bureau of Investigation, told members of the problems of sabotage. The group's annual achievement award was presented to Harold S. Falk, president of the Falk Corp., Milwaukee.

Bull Market Omen Threatens Scrap Prices

Cleveland formula front has halted runaway market . . . But secondary stage may not come off so smoothly . . . Winter, small mills, converters attack structure—*By Bill Loyd.*

Cleveland—Over the buzz of a solid but volatile market this week a careful ear could detect the sound most scrap buyers least like to hear, the bellow of an approaching bull.

That major consumers have heard this omen seems apparent since most of them are not canceling anything, including older, higher-priced orders, and are glad to get what they need at the formula.

Thus far, the formula has been a nominal success for most of the major consumers; that is, the runaway market of 6 weeks ago has been halted, temporarily at least, and a certain amount of inventory, perhaps 45 days, has been accumulated. Some of this tonnage stems from older, higher orders. However, in its primary phase, the formula has worked.

During the past 10 days there have been signs that the secondary phase, which would include complete resignation on the part of the trade to the $44 level and perhaps a market ripe for a break, will not come off so smoothly. For one thing, winter is coming. Some mills might get out of the market right now if they were not afraid of this.

Another potent factor is small mills and converters. Lip service has been given to the thought that if these consumers want to pay more money, let them. This is not a general view, however, if for no other reason than the converters are a powerful factor in the present tight market.

Foundries Take No. 2

At the moment, foundry material is running away from open-hearth grades in price, and plenty of dealers are tossing their premium tonnage in that direction. Some foundries are even taking No. 2 steel as foundry steel.

The weight of industrial plant and railroad tonnage is also being felt. It was generally assumed that most of this tonnage would be sold on the basis of the formula. Some has, but serious opposition is in the making and certain sellers are frank to say they are going to sell their tonnage for the top dollar.

A significant test of the formula will come within 30 days when the small consumers and converters come into the market for tonnage. Two alternatives will face them. First, dealer scrap, for which no springboards have been set up, and premium prices.

With some railroads getting $60 for short rail and $56 to $57 for uncut, and foundries begging for every ton, premium prices could

be almost anything. Real discipline would be required to hold the formula under such an onslaught.

On the other hand, it is possible that the formula may be raised. This happened on one grade in a major district last week and if the major consumers should be willing to pay more, such competition could be met. But this would mean a higher formula or none at all.

Repetition of History?

In the trade, where the formula is unpopular, the feeling seems to be that history will repeat itself. That is, the market will get too hot for the formula and it will be every man for himself. This would suit the dealers nicely. They don't like to gamble with $40 tonnage. A rise would be followed by the usual break, which would give them opportunity to buy against the next rise, etc.

The big unknowns are Korea and the weather. If victory in Korea means a slackening in defense preparation and industrial activity, the market will break and gather new momentum later. As regards the weather, the brokers who today are being offered little $43 scrap by dealers will tell you the formula could disappear in the first snowstorm.

Rust Gets Wind Tunnel Contract

Birmingham—A contract to test and recondition about 3000 tons of German wind tunnel equipment has been awarded to the Rust Engineering Co., here, by the Air Engineering Development Center, the $157 million Air Force project near Tullahoma, Tenn. The job will take about 18 months.

Sell Company-Owned Houses

Birmingham—Alabama Fuel & Iron Co. has sold 500 company-owned houses and commissaries in the Overton and Acmar mining communities to Marc Levine Industrial Real Estate Corp., Clarksburg, W. Va. Marc Levine, president of the buying firm, said that homes will be offered for sale to present occupants first.

CLOSE INSPECTION: Officials and workers of Canada's first stainless steel sheet mill at Welland, Ontario. R. H. Davis, president of Atlas Steels Ltd., is shown receiving the first commercial sheet from Clair Seburn, shearman. Left to right are Jasper Merr, assistant shearman; Seburn; Davis; Gilbert Soler vice-president in charge of manufacturing; and Edward P. Geary, vice-president and general sales manager.

Canada's First Stainless Sheet Mill Deluged with Orders

Atlas plans cold reduction mill . . . Inspired by unexpected demand.

Welland, Ontario—The first Canadian producer to tap domestic demand for stainless steel sheets, Atlas Steels Ltd. has been swamped with orders for its new hot-rolling mill which started production in September. With high demand justifying its decision to build, Atlas now will install a cold reduction mill to provide a greater stock and wider range of sheets.

Break Ground for Cold Mill

When the new mill was on its trial run last August, Atlas, in a statement of policy, said it recognized that mill capacity would top immediate demand but that it was relying on demand to develop. (THE IRON AGE, Aug. 10, 1950, p. 77.) Demand has scuttled this prediction.

Ground has already been broken for the cold mill as an addition to the North Plant here. Installation is planned within 6 months. The present mill produces hot-rolled, annealed or ground and polished sheet in several finishes and the proposed cold mill will complement hot mill production.

Orders have been heavy enough to put the hot mill on a 3-shift, 24-hr basis and sheet is shipped while it is still warm. Atlas reports that demand for stainless bar, rod and wire, also produced by the firm, has been increasing.

Submerged Steel Protection

New Orleans—Methods for using Monel or a 70-30 copper-nickel alloy for protecting the "splash zone" of drilling structures and piers located in sea were discussed by B. B. Morton in a paper, "Protection of Structures Exposed to Sea Water" at the fifth annual meeting of the Petroleum Mechanical Engineers, American Society of Mechanical Engineers. He concluded that impressed current can best protect submerged steel; Monel or the copper-nickel alloy protect the "splash zone"; and paints or zinc coat exposed surfaces.

Reach Westinghouse Pact

Pittsburgh—Westinghouse Electric Corp. and the International Union of Electrical Workers (CIO) reached agreement Oct. 1 on a new 1-year contract calling for wage increases of 10¢ per hr effective Sept. 18, plus a 1¢ per hr fund for the correction of wage inequities, effective Oct. 1.

U.S. Steel to Add 500,000 Tons to TCI in Move for Defense

Supplements 1,660,000 ton boost . . . To increase blast furnace output.

New York—U. S. Steel Corp. will add 500,000 tons of annual ingot capacity to the present 2,850,000 tons of its subsidiary, Tennessee Coal, Iron and Railroad Co., Birmingham, as part of a current expansion program revised to meet the needs of national defense in the shortest possible time, said Ben Fairless, U. S. Steel president, and Robert Gregg, TCI head, in a joint statement last week.

The TCI expansion will supplement the program advanced last July when U. S. Steel reported that it will increase its steelmaking capacity by 1,660,000 tons annually by 1951. (THE IRON AGE, July 27, 1950, p. 80.) A third expansion step will come with the building of U. S. Steel's Eastern Seaboard mill at Morrisville, Pa. Not-yet-formulated defense needs will govern size of the plant and its products.

To be available within 18 to 24 months after building begins, the TCI capacity will be derived from spurring the output of existing Birmingham district blast furnaces "through the blending of imported iron ore with lower grade Alabama ores" and convert this increased iron production into steel by installing openhearths and auxiliary facilities at the Fairfield Works.

Ore transfer facilities will be built at TCI's new Mobile, Ala., port terminal to handle the needed foreign ore shipments.

Set Up Minerals, Energy Agency Under Interior Dept.

Washington—A Minerals and Energy Administration to handle defense responsibilities of the Department of Interior under the Defense Production Act was announced last week by Secretary of the Interior Oscar L. Chapman. He will serve as administrator of four industry agencies, each headed by an assistant administrator.

The four zones of responsibility of the Interior Dept. are electric power, petroleum and gas, solid fuels, and metals and minerals. A soon-to-be established Requirements Committee will advise the administrator on the allocation of resources and priority ratings. "Fullest possible use of industry advisory committees" will be the policy, said Mr. Chapman.

Key officials, serving on a temporary basis, are setting up the new agency under Alfred C. Wolf, director of the Department's Program Staff and now acting executive assistant to Mr. Chapman.

The new agency will expand and maintain supply of pertinent raw materials, estimate needs for equipment, supplies, transportation, storage, and manpower. It will distribute resources, guarantee and certify loans, supervise installation of government equipment, and recommend industry conservation programs.

Enlarge Furnace in 72 Days

Pittsburgh—Relining and enlargement of a Carnegie-Illinois Steel Corp. Clairton Works blast furnace was completed in 72 days, 8 days ahead of schedule, by 300 technicians out for a record. In the eight days gained, the furnace will produce 2000 tons of ferromanganese. Diameter of the furnace hearth was enlarged to 18½ ft.

"According to past experience, Benson, you will ask me for a raise only three more times—before I fire you."

Sharon Steel Expansion To Lift Capacity to 2 Million Tons

Sharon, Pa.—A 5-year expansion-improvement program starting this year and costing an estimated $50 million will raise the annual ingot capacity of the Sharon Steel Corp. to close to 2 million tons, a spurt of about 560,000 tons, disclosed Henry Roemer, Jr., president, last Monday, during Sharon's fiftieth anniversary week.

Sharon estimated its expansion-bolstered 1955 capacity as 1,600,000 tons for the Dept. of Commerce, but this is regarded as a conservative figure. Latest Sharon capacity reported to the American Iron and Steel Institute was 1,440,000.

Details of Expansion

Expansion will involve building a new blast furnace with 850 tons daily capacity; enlarging eight openhearths to step up heats from 130 tons to 200; installing Bessemer converters for duplexing and to boost Bessemer capacity to 300,000 tons annually; installing a blooming mill with either 40-in. or 44-in. bloomer and a hot strip mill; and new coke and by-products coke plants to cost about $3 million. The program is expected to double stainless steel capacity.

A 15-year iron ore contract signed with the Oliver Iron Mining Co. was approved by the board of directors and possibilities of receiving ore from the Orinoco River, Venezuela, (U. S. Steel's Cerro Bolivar) were discussed. Sharon's present needs run about 1 million ore tons per year.

In discussing recent Sharon price increases, Mr. Roemer brought up the question of sound financing. "The best way to improve and buy new equipment is to do it out of earnings," he said. "A lot of expansion and improvement is necessary and it must come out of profits."

Net profits for the 6-month period ending June 1950 were listed as $4,593,237 as compared with $3,422,792 for the same 1949 period.

AMA Awards 1950 Gantt Medal To C. R. Hook, Armco Executive

New York—Charles R. Hook, Sr., was awarded the 1950 Henry Laurence Gantt memorial gold medal at a meeting of the American Management Assn.'s Personnel Conference held here this week. Mr. Hook's record for "distinguished achievement in industrial management as a service to the community" was cited.

Mr. Hook, chairman of the board of Armco Steel Corp., was further cited for "far-seeing policies in the field of human relations . . . the foundation of a company - community - employee team imbued with that spirit of mutual confidence and respect . . . essential to industrial peace."

C. R. Hook

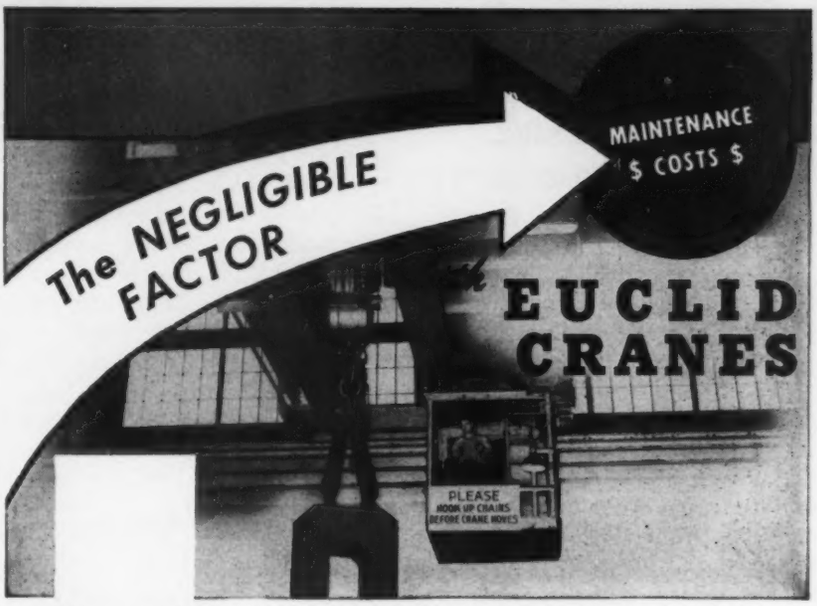
The Gantt award has been made annually since 1929 by the AMA and the American Society of Mechanical Engineers. Mr. Hook joins a group of distinguished industrialists, holding the award, including Paul G. Hoffman, Alvin E. Dodd, Fowler McCormick, Arthur C. Spurr, John M. Hancock and William L. Batt.

5000 Freight Cars Ordered By Pennsy; to Cost $30 Million

New York—Pennsylvania Railroad has ordered 5000 additional freight cars at a cost of $30 million. The new order brings to 20,360 the total of freight cars scheduled for delivery, including 10,000 to be obtained through leasing arrangements.

Pennsylvania's new order will raise the company's expenditures for modernization and expansion to $522,221,000. Nearly four-fifths of this will be spent for freight cars and diesels.

Louisville & Nashville Railroad will spend $17 million for new diesel engines, boxcars and rails.



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Nonferrous Exports Limited By New U.S. Destination Controls

Washington—Fourth quarter export quotas on nonferrous metals have been tightened with the announcement by the Commerce Department of additional destination controls.

Aluminum, copper, brass, bronze, lead and zinc are covered in the new order. The controls apply to ores, raw materials, mill and end products. The order verifies a policy already in effect since export applications for these products have not been approved since the beginning of September.

Evidence of Availability

Canada becomes the only country for which validated export licenses will not be required. Formerly, validated licenses were necessary only for shipments made outside the Western Hemisphere.

New applications must include evidence of availability, a certificate of accepted order, and a detailed statement of the end use of the product. Outstanding licenses for nonferrous metals covered by fourth quarter quotas will not be valid on and after Oct. 20 unless approval has been secured.

Purpose of the destination controls will be to establish quotas for next month. The Dept. expects to establish quotas about Oct. 20.

Named Brassert Vice-President

New York—Herman F. Dobscha has been appointed vice-president of H. A. Brassert & Co., consulting engineers, this city, effective Sept. 1. Mr. Dobscha has been supervisor of Carnegie-Illinois Steel Corp.'s Edgar Thompson blast furnaces. Previously he was assistant Cleveland district manager for Republic Steel Corp. and recently was manager of Wheeling Steel Corp.'s Mingo Junction works.

Cartier Construction to Get Contract for Labrador Ore Road

Montreal — Construction of the 360-mile railroad from Seven Islands on the St. Lawrence River to the iron range along the Quebec-Labrador border is to be started soon. The new road, to be owned and operated by Quebec North Shore & Labrador Railway Co., a subsidiary of Iron Ore Co. of Canada, will cost upwards of $100 million. Construction contract for the railroad will be let to Cartier Construction Co., Quebec and associates—McNamara Construction Co., Toronto; Fred Mannix & Co., Calgary, and Morrison-Knudsen Corp., Boise, Idaho (THE IRON AGE, Aug. 31, 1950, p. 71)

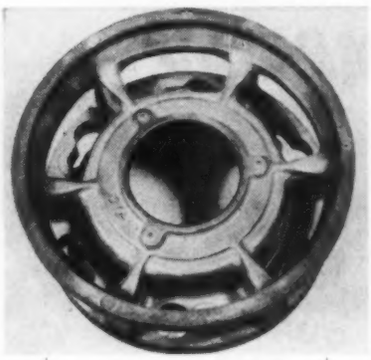
Working Against Delay

Major construction of the big project will not start until next spring but preliminary work will begin at once. A temporary dock at Seven Islands is being rushed to completion to enable handling of construction equipment. Work will proceed through winter to complete several rock cuts and tunnels so construction of the road will not be delayed next year.

Airfields are to be established at intervals to service construction, and men will be put on cutting right-of-way and other pregrading work this winter. Next summer the Federal government will go ahead with the permanent deep-water docks at Seven Islands. Around the docks will be built the ore handling equipment and ore storage yards.

Assurance for the steel needed has been given by Ottawa. Similar assurance regarding construction equipment has been given by the U. S.

It is planned to start getting the iron ore bodies ready for production in 1953 so that by the fall of 1954 between 2 and 3 million tons of ore will be ready for shipment when the railroad is completed. The project calls for shipping 10 million tons annually.



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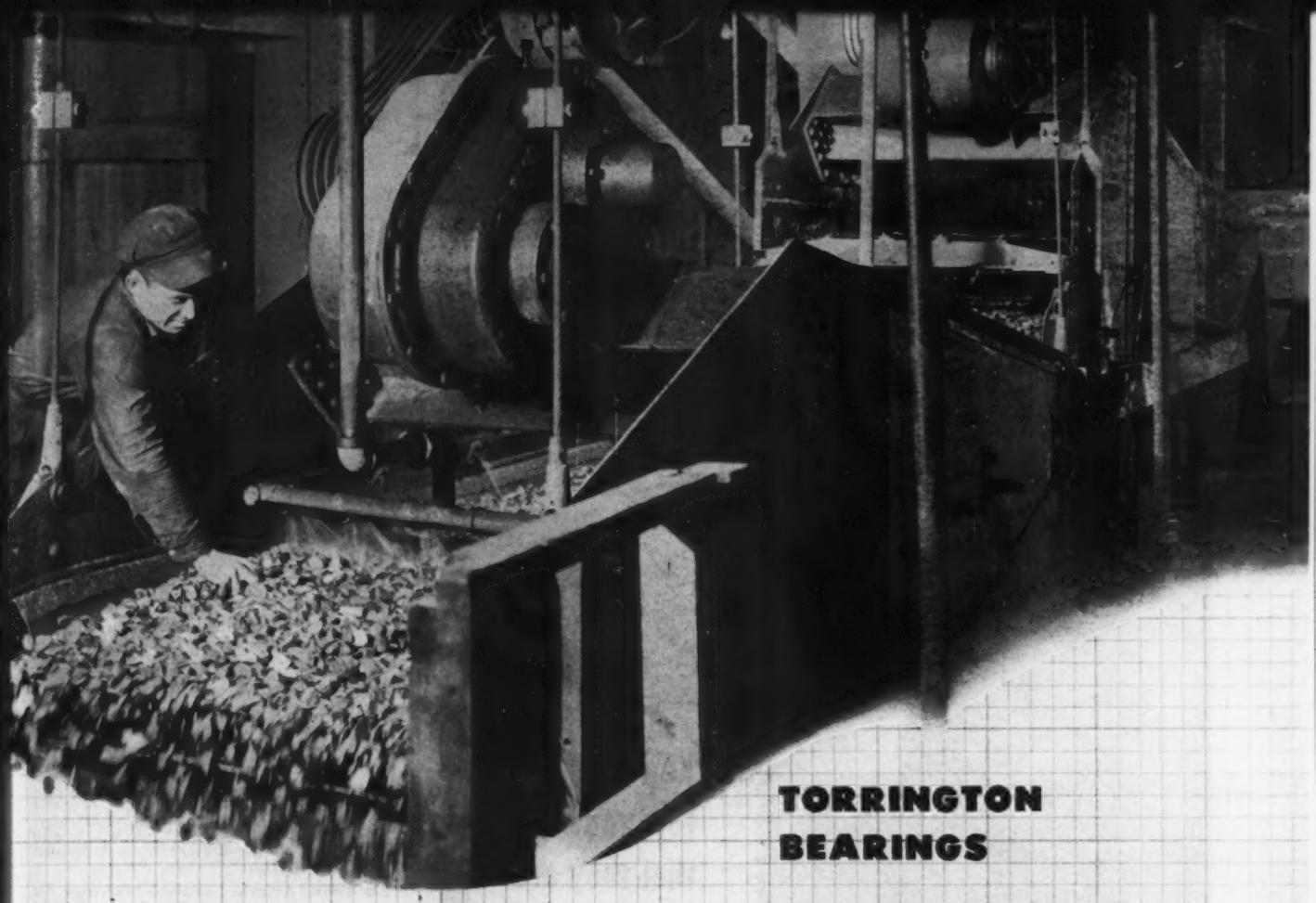

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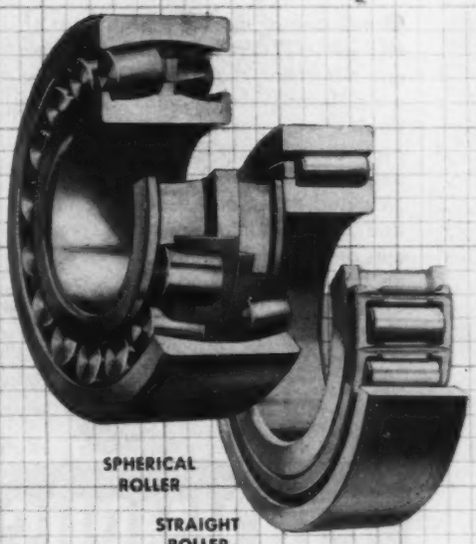
It may pay you, too, to consult our engineers' special knowledge of all major bearing types in connection with *your* friction problems.



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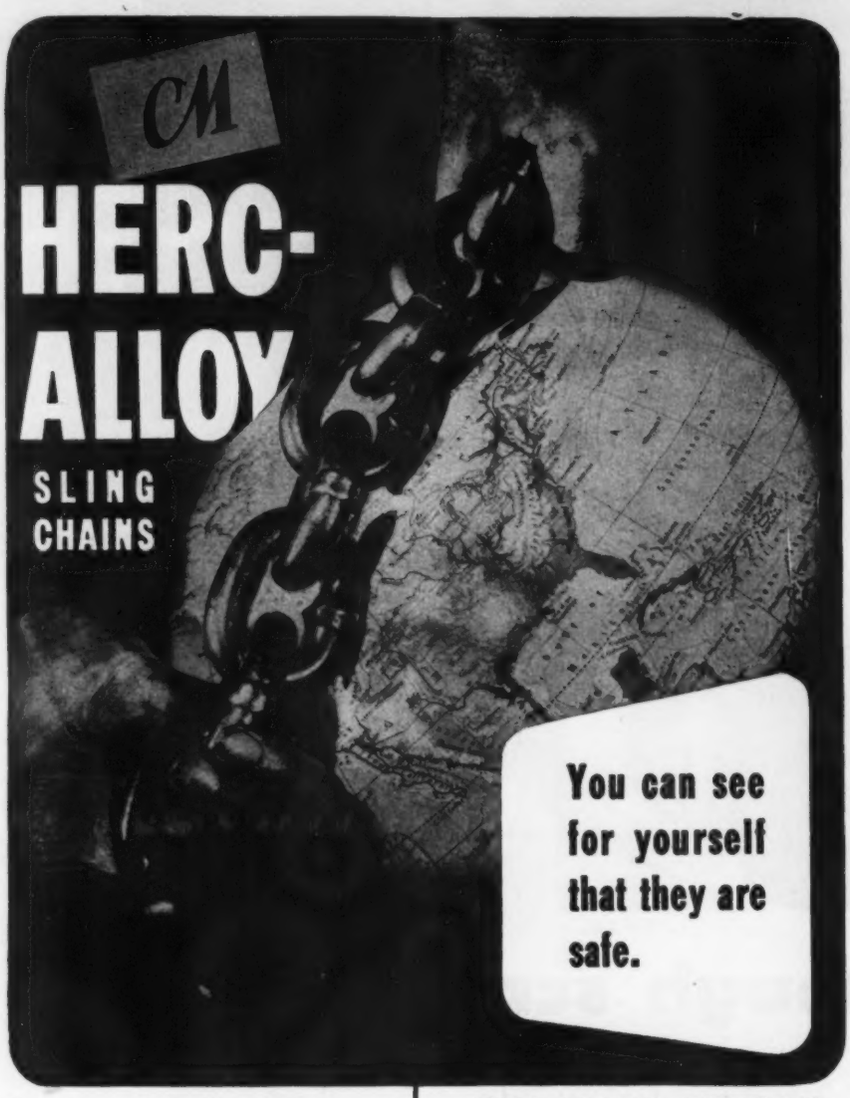

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STEEL CONSTRUCTION NEWS

Fabricated steel awards this week included the following:

2500 **Tons,** Milwaukee, municipal stadium, to Milwaukee Bridge and Worden-Allen Co., Milwaukee.

650 **Tons,** Camp Curtin Junior High School, Harrisburg, Pa., to Standard Equipment Co., Harrisburg.

600 **Tons,** Salem, Mass., coal handling plant for New England Power Service Co., through William T. Donovan Co., Boston, to Albert O. Wilson Structural Steel Co., Cambridge, Mass.

550 **Tons,** Boston, Mass., new $1,500,000 Library Building on Northeastern University campus, Huntington ave., Back Bay, through Sawyer Construction Co., to American Bridge Co., Pittsburgh.

270 **Tons,** Chippewa City, Wis., bridge project Fagm-020-1/19/, to American Bridge Co.

235 **Tons,** Astoria Federal Savings & Loan Association, Long Island City, N. Y., to Grand Iron Works.

126 **Tons,** Chicago, warehouse for Grocerland, Inc., to Jos. T. Ryerson and Son, Chicago.

115 **Tons,** Grant County, Wis., bridge 5-0101-/3/, to Theo. Kupfer Foundry and Iron Works Co.

Fabricated steel inquiries this week included the following:

750 **Tons,** New building for the Wharton School of the University of Pennsylvania, Philadelphia, bids due Oct. 20.

360 **Tons,** New Jersey Dept. of Highways, highway bridge on Route 151, Camden County, bids due Oct. 17.

150 **Tons,** Pennsylvania Dept. of Highways, highway bridge on Route 292, Section 8, Tioga County, bids due Oct. 13.

Reinforcing bar awards this week included the following:

1400 **Tons,** New mill for Dan River Mills, Danville, Va., United Engineers' & Constructors' Co., Philadelphia, general contractors, to Bethlehem Steel Corp., Bethlehem, Pa.

1200 **Tons,** Waltham and Weston, Mass., construction of new Route 128 (circumferential highway around Boston), to J. F. Fitzgerald Construction Co., Boston, to Joseph T. Ryerson and Son, Inc., Cambridge, Mass.

600 **Tons,** Somerville, Mass., housing project for veterans through Calumet Construction Co., Roxbury, to Joseph T. Ryerson and Son, Inc., Cambridge, Mass.

200 **Tons,** Boston, Mass., new $1,500,000 Library Building on Northeastern University campus, Huntington ave., Back Bay, through Sawyer Construction Co. to Concrete Steel Co., Boston.

200 **Tons,** Extension of Market Street Subway from 42nd to 46th St., Philadelphia, Buckley & Co., Philadelphia, general contractors, to Bethlehem Steel Corp., Bethlehem, Pa.

Advertisement

ELECTROMET Data Sheet

A Digest of the Production, Properties, and Uses of Steels and Other Metals

Published by Electro Metallurgical Division, Union Carbide and Carbon Corporation, 30 East 42nd Street, New York 17, N. Y. • In Canada: Electro Metallurgical Company of Canada, Limited, Welland, Ontario

How Manganese Briquets Control Sulphur . . . Produce Cleaner, Sounder Iron Castings

The use of manganese briquets in the cupola charge provides a convenient and accurate method of controlling this important element in cast iron. Accurate control of the manganese level is essential for the consistent production of high-quality iron. While manganese will be introduced in varying amounts by the pig iron and scrap, a supplementary source—such as manganese briquets—is usually essential if accurate analysis control is to be maintained.

Manganese has two important functions in cast iron:

1. It acts as a sulphur-neutralizing element when used in small amounts – up to roughly six times the sulphur content.
2. It acts as an alloying element, imparting density and strength when present in amounts greater than necessary to perform its desulphurizing function.

Neutralizes Sulphur

Cast iron tends to run considerably higher in sulphur than was the case a decade ago because there has been an increase in the sulphur content of both scrap and foundry coke in recent years. Unless sufficient manganese is provided in the cupola mixture, this higher sulphur content will tend to produce a hard, brittle metal with deep chilling properties and poor fluidity. Castings of such metal are difficult to machine and may be the cause of many foundry troubles, including strain cracking, chilled corners and edges, and misrun castings.

Since manganese has a high affinity for sulphur, it forms manganese-sulphide inclusions when present in sufficient amounts. These inclusions are relatively harmless to the metal, and the detrimental effects of the sulphur content are thus largely eliminated. It is good practice to maintain a manganese-sulphur ratio of approximately 6:1 to insure proper neutralization of the sulphur content.

A certain proportion of the manganese-sulphide that is formed will float to the surface of the molten iron and be absorbed by the cupola slag. In this way, manganese actually eliminates a portion of the sulphur introduced by cupola melting. Thus, relatively high manganese irons will invariably run lower in sulphur than will metal melted from similar raw materials but of lower manganese content.

Sounder Castings

The cleansing effect of manganese is a decided help in producing a high-quality foundry product with a minimum amount of trouble from porosity, shrinks, and blows. Manganese helps to neutralize gassy metal that may result from temporarily unbalanced cupola conditions or poor-quality melting materials. It improves the fluidity of iron that may be a little on the cold side or high in sulphur. Manganese does a general cleansing job that is helpful in avoiding slag inclusions, which have a detrimental effect on machinability.

Alloy Effects

When manganese is used in amounts greater than that necessary to neutralize sulphur, it acts as a desirable carbide-stabilizing alloy in cast iron. Depending on the amount added and other elements present, manganese tends to refine pearlite and, at higher levels, to form martensite. Increasing the normal percentage of manganese in cast iron to 1 per cent or above will often change a normally ferritic-pearlite matrix to the stronger all-pearlitic structure.

Two Types of Briquets

ELECTROMET produces two types of manganese briquets – EM silicomanganese briquets and EM ferromanganese briquets. The silicomanganese type is square in shape and contains exactly 2 lb. of manganese and about ½ lb. of silicon. Ferromanganese briquets, which are oblong in shape, also contain exactly 2 lb. of manganese, but do not contain silicon.

The recovery of manganese from EM manganese briquets normally runs about 85 per cent, because the briquets are made with a binder that prevents oxidation until the alloy unites with the iron in the melting zone of the cupola.

A typical mixture for high-strength iron is given in the accompanying table. For further information—

The terms "EM" and "Electromet" are registered trade-marks of Union Carbide and Carbon Corporation.

Typical Cupola Charge for Producing High-Strength Iron With EM Briquets

Base Charge			Alloys in Charge Material			
			Silicon		Manganese	
%	Lb.	Material Charged	%	Lb.	%	Lb.
15.0	150	Pig Iron	2.30	3.45	0.70	1.05
40.0	400	Steel Scrap	0.10	0.40	0.45	1.80
35.0	350	Return Scrap	1.90	6.65	1.00	3.50
10.0	100	Purchase Scrap	2.00	2.00	0.45	0.45
100.0%	1,000 lb.	Total Base Charge		12.50		6.80
Briquets Required		7½ Small Silicon		7.50		—
		2½ Silicomanganese		1.25		5.00
		Total Alloys Charged		21.25 lb. Si. or 2.12% Si.		11.80 lb. Mn. or 1.18% Mn.
		Melting Recovery Factor		x .90		x .85
		Final Analysis of Iron		1.90% Si.		1.00% Mn.

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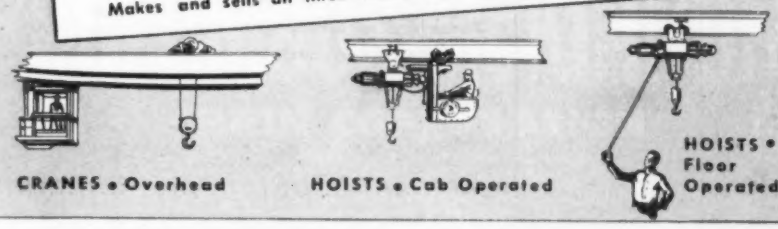

356 SCHUYLER AVENUE • MONTOUR FALLS, N. Y.

Columbia Transportation to Build Two $5 Million Ore Vessels

Cleveland—Columbia Transportation Co., vessel subsidiary of Oglebay, Norton & Co., has placed orders for construction of two 19,500 gross ton capacity ore carriers, bringing to eight the number of bulk freighters which will be under construction in Great Lakes shipyards within a few months.

The vessels will cost over $5 million each. Acquisition of two large new vessels will increase the company's bulk fleet to ten vessels. Bulk vessel trip capacity will be increased by 50 pct, from 78,000 tons to approximately 117,000 tons.

Columbia's ore carriers will be 647 ft. in length overall and have a 70 ft. beam. The main propulsion machinery, which will give the vessels a speed of 16.3 miles per hr., when loaded, will be geared steam turbines developing 7000 hp.

One of the new vessels will be built by the Great Lakes Engineering Works at their River Rouge, Mich., yards and delivery has been set for June 1952. The other will be built at the Lorain yards of American Ship Building Co. and delivered in August 1952.

Structural Steel Bookings High

New York—Fabricated structural steel bookings for the third month continued at the highest rate since 1942, according to the American Institute of Steel Construction. August bookings totaled 250,910 tons, and the total for the first 8 months of 1950 reached 1,563,767 tons, an increase of 69 pct over the same period of 1949.

'49 Steel Shipments Under '47

Washington—Steel mill product shipments for 1949 totaled 56.9 million tons, a drop of more than 7 million tons from the 1947 figure of 63,187,058, according to the Department of Commerce. Ingot production in 1949 totaled 77.9 million tons.

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Shifting Ore from Ship to Shore

When shipments of foreign iron ore reach the United States at Curtis Bay, Maryland, a high-speed, twin-tower marine leg and belt conveyor unloading system will take over.

Fast action is a must. The faster the ore can be unloaded, the sooner the ship can get under way for another load . . . the sooner the ore can be on its way to the mill . . . the less the cost per ton.

One factor that will aid the speedy transfer of the ore from ship to shore at the Curtis Bay Dock is the installation of Westinghouse Motors and Speed Reducers. Here, the Westinghouse Geared Drives will keep the ore moving at a capacity rate of 200 tons per hour.

Specification of complete Westinghouse Geared Drives for such installations has become standard practice with many contractors. Experience has shown them that these drives, selected with undivided responsibility, are unparalleled for long-term reliability.

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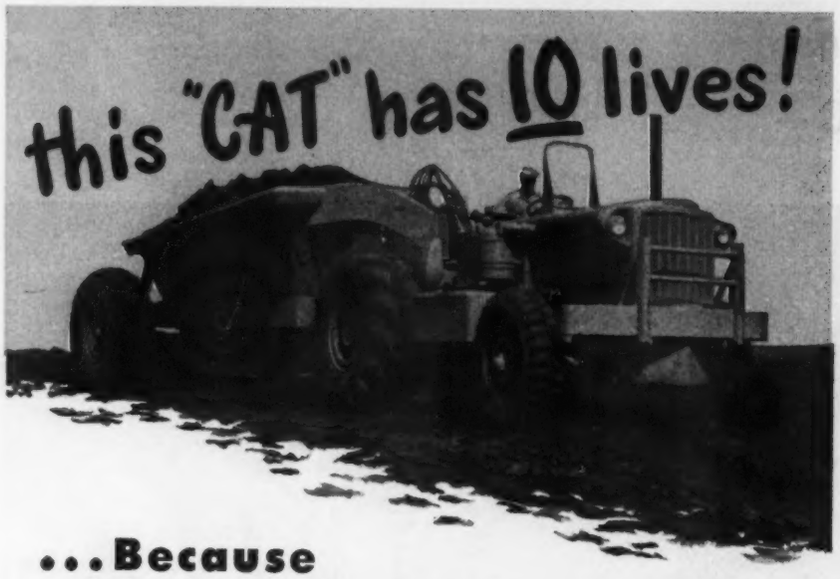
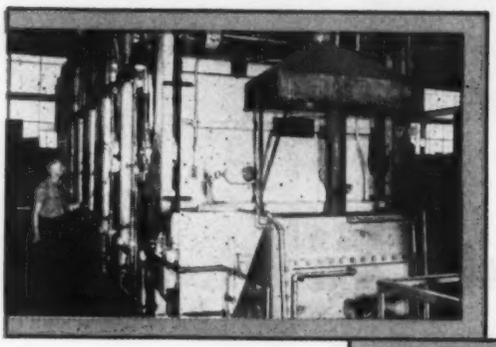
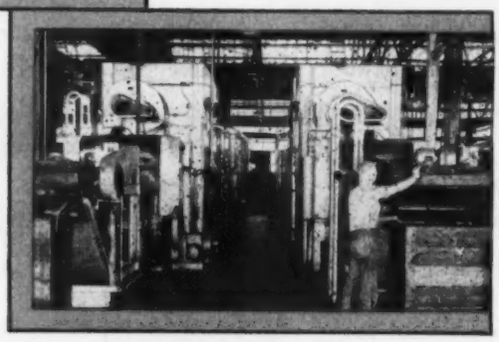


...Because critical parts are heat treated in HOLCROFT furnaces

Caterpillar Tractor Co.—producer of rugged, long-lasting earthmovers—adds another life to the cat's proverbial nine! This new model will last longer because certain critical parts are hardened and drawn in Holcroft furnaces. Result: extra stamina for the product and lower costs for the owner. Plant savings are possible because of high production, fast operations and fewer rejects.



This is the discharge end of one of two Holcroft hardening furnaces in the "Caterpillar" plant. It is radiant-tube-fired, completely conveyorized, and has a capacity of 3000 lbs. per hour.



This is the unloading end of the twin draw furnaces. They are also conveyorized, using alloy roller chains. The furnace is heated by gas-fired recirculating heaters.

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PUBLICATIONS

Continued from Page 34

diesel-electric locomotives, motors, generators and insulated power lines, and dielectric strength testing of materials. *Associated Research, Inc.*

For free copy insert No. 8 on postcard, p. 35.

Roller Levelers

Different types and sizes of roller levelers, and the function of each, are outlined in a new 20-p. bulletin. The booklet covers leveler terminology, how to select the right leveler, space necessary for installation, and deals individually with worm drive levelers, separately adjusted levelers, inverted and universal levelers, and leveler rolls and accessories. *McKay Machine Co.*

For free copy insert No. 9 on postcard, p. 35.

Charging Wheelbarrows

Single- and two-wheel models of Sterling charging wheelbarrows are shown on a new data sheet. The circular lists specifications and illustrates these sturdily constructed, well-balanced, forward dump wheelbarrows for handling loads up to 1000 lb. *Sterling Wheelbarrow Co.*

For free copy insert No. 10 on postcard, p. 35.

Solves Corrosion Problems

Atlas corrosion-proof linings, when applied to concrete or steel, protect the equipment against specific corrosion conditions, as outlined in a new 4-p. bulletin. Data presented includes specifications for the various linings, and will aid in the selection of a proper lining. *Atlas Mineral Products Co.*

For free copy insert No. 11 on postcard, p. 35.

Work Benches

Construction features and general information on Hallowell work benches are presented in a new 8-p. catalog. Several models are shown, available in various top materials and sizes. Bench drawers, draw tiers, bench legs and other parts and accessories are also listed. *Standard Pressed Steel Co.*

For free copy insert No. 12 on postcard, p. 35.

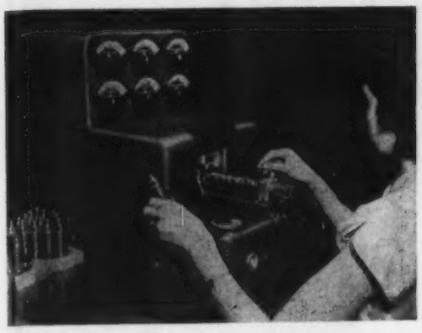
Resume Your Reading on Page 35

NEW

PRODUCTION IDEAS

Continued from Page 38

dials that are calibrated in hundred-thousandths of an inch. Limit hands show at a glance whether



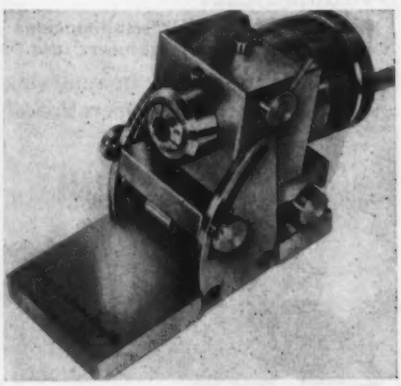
parts are within tolerance. *Pratt & Whitney, Div. Niles-Bement-Pond Co.*

For more data insert No. 28 on postcard, p. 35.

Grinding Attachment

Facilitates grinding combinations of surfaces in a single setting.

Combinations of cylindrical surfaces, tapers, indexed sections, splines grooves, radii, or other forms may be closely ground with absolute concentricity of form using the new Starco Master grinding attachment, it is reported. Four



major features of the precision instrument contribute to maximum savings in setups: a sine plate held to within 0.0001 in. allows rapid setups for tappers; 12 positive stops held to within 1 min permit rapid indexing of common divisions; for odd angles, a finely cut dividing head and vernier provide settings for any angle within 2½ min; the unit eliminates the use of indica-

Save up to 40% on melting metals*

*KEMP...Immersion Pots Melt Metal Under Ideal Conditions—Control Degree, Rate and Distribution of Heat, Limit Dross Formation

NO MATTER WHAT soft metals you heat: lead, pewter, tin or salt—for coating, annealing, tempering or a special application—your plant needs Kemp Immersion Heating! Take *heat recovery* as an index of Kemp's amazing performance. A full *12 ton* Kemp pot, out of service for *two days*, can be brought to 600° F. in *less than two hours!*

PAYS FOR ITSELF

Even if your melting equipment is large enough for the job . . . when you replace with Kemp you're money ahead. No brickwork to steal heat . . . no external combustion chamber . . . no carbon monoxide . . . no temperature overrun. You get *high melting rates*, reduced dross formation, speed of temperature recovery after adding cold material . . . PLUS *an estimated fuel saving of up to 40%*!

FOOLPROOF OPERATION

The famous Kemp Carburetor . . . part of each installation . . . assures complete combustion, reduces installation costs, makes your melting operation profitable. Get the facts. Find out how much you can save. Fill out coupon and send for special bulletin.

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Company .....
Address .....
City ..... Zone ..... State .....

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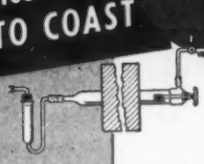
Giving Outstanding Service in Metallurgical Laboratories FROM COAST TO COAST

McDANEL HIGH TEMPERATURE COMBUSTION TUBES



OTHER McDANEL PRODUCTS

- Non-Spalling, non-blistering, gas tight Combustion Tubes.
- High Temperature Zirco Tubes.
- Self Cooling Combustion Tubes.
- Refractory Porcelain Specialties in stock or made to your specifications for your individual needs.

The acid test for any product is how it stands up in service. Here is what leading metallurgists in the iron and steel industries say about McDanel Porcelain Combustion Tubes and Zirco Tubes: "Highly satisfactory in every respect"—"Never spall or blister"—"We run 8 to 10,000 carbon and sulphur analyses a month with seldom a failure".

McDanel Refractory Porcelain Co.
Beaver Falls . . . Penna.

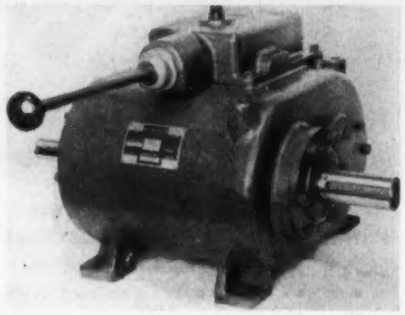
tors in setting up. The attachment can be placed under the wheel of the surface grinder; it is not limited by the vertical travel of the grinder. *Star Gauge Co., Inc.*

For more data insert No. 29 on postcard, p. 35.

Transmission Unit

Twenty hp with 900 rpm input speed.

Four speed changes are in geometric progression of 1.7:1 with a 5:1 overall ratio. The transmission case can accommodate special



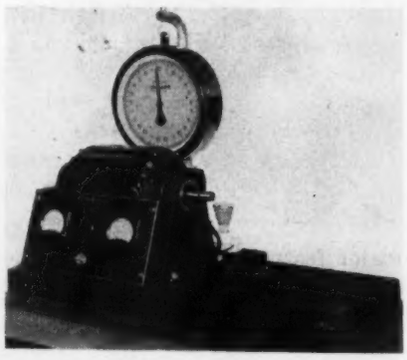
ratios up to 9:1. All gears and shafts are alloy steel, heat treated and the gears are shaved. All revolving shafts are mounted on antifriction bearings and the case is oil sealed. The unit is identified as the 420. *Western Mfg. Co.*

For more data insert No. 30 on postcard, p. 35.

Dynamometer

Fractional-hp set for small-machine and appliance manufacturers' use.

The instrument aids in analyzing and demonstrating the operation of



fractional-hp motors, generators and dynamometers. It is a self-contained unit with extended base to allow for mounting of the equipment under test. A control panel contains instruments for reading

in a hurry?

If production schedules are tight, and you need specialty steel extra fast, you can't beat Crucible's quick delivery from 23 warehouses... completely stocked to meet your immediate requirements. If you're out of stock, don't need, or can't wait for a mill-sized shipment, the Crucible warehouse is the place to go.

See for yourself how well prepared Crucible is to serve you. Come in to the Crucible warehouse near you and look over the complete stocks maintained to help you meet production deadlines. Ask about Crucible's alert metallurgical staff, which is freely available to you on your specialty steel applications. Make Crucible your warehouse. It's a good habit that makes your inventory planning easier.

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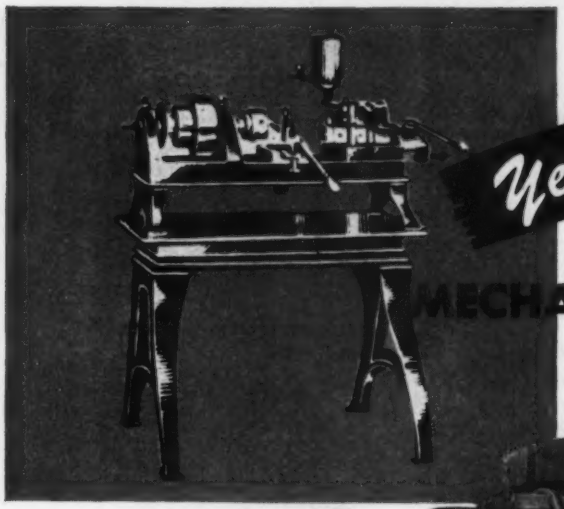
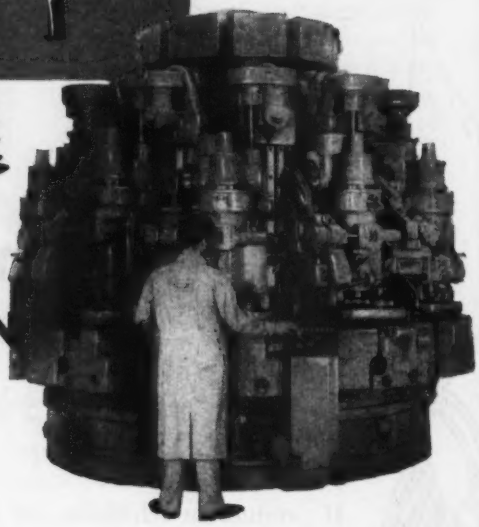


Yesterday

MECHANIZATION

Today

AUTOMATION



Always

STUART CUTTING FLUIDS
for HIGHER PRODUCTION

HIGHER SPEEDS! Greater feeds! Closer tolerances! Better finishes! New materials! Automatic operation! Lower costs! More production!

Those are the challenges D. A. Stuart Oil Co. has been helping the metal-working industry meet since 1865. *And, every moment of progress has spotlighted the critical importance of cutting fluids.* You will never get the production that is built into modern machine tools without the *best* cutting fluid for the job *properly applied.*

A Few Examples

- 150% increase in production on linemen's pliers *after* applying Stuart Oils on four operations.
- FEEDS, SPEEDS UPPED 50% on turret lathe operation after Stuart's SOLVOL was applied.
- 285 PIECES ground per wheel dressing since applying Stuart's SUPERKOOL 81, where only 20 pieces were obtained before. Now *full automatic* operation.

COME TO THE METAL SHOW in Chicago October 23-27. Bring your problems to Stuart Booth No. 328.

WRITE FOR "CUTTING FLUID FACTS"

D.A. Stuart Oil CO.

2737 S. Troy St., Chicago 23, Ill.

Continued

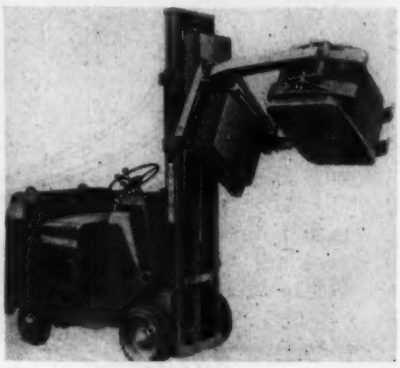
field voltage and armature current, a field control rheostat and a three way switch for selecting desired resistance loads. Its preloaded scale permits direct readings with the unit operating as a motor or generator. *General Electric Co.*

For more data insert No. 31 on postcard, p. 35.

Annealing Pot Dumper

New device picks up, rotates and dumps heat-treated metal parts.

The annealing pot dumper is a modification of the revolving barrel grab, with special gripping shoes freely pivoted on the grab arms for self-positioning around the heavy, irregularly-shaped annealing pots. In operation the pot dumper picks up a pot of castings after it has been removed from



the annealing oven and cooled, carries the load to a shake-out table, inverts the pot of castings over the table, and places the inverted pot on the table. After the pot of castings has been shaken out to empty it, the lift truck picks up the pot, rotates it to an upright position, and places it on a conveyer for return to the annealing department. The dumper has a capacity of 2100 lb at 30-in. load center. Height of lift is 108 in. and overall lowered height is 83 1/3 in. *Towmotor Corp.*

For more data insert No. 32 on postcard, p. 35.

Bar Automatics

Built with four and six spindles and capacities of 3½ and 2⅝ in.

Two new machines are said to offer the advantages of heavy metal-removal, extreme accuracy and fast output on long or short-run batches. The Wickman patented autosetting mechanism effects alterations to

tool feed strokes and bar feed without cam-changing yet leaves unaltered the full fast approach stroke, simplifies setup, reduces changeover time, and dispenses with costly interchangeable cams. Power up to

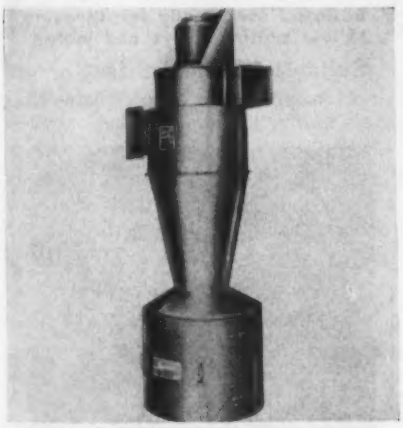
40 hp is available from a protected type motor mounted on a platform at the rear and controlled by stop-inch-start buttons mounted at the front and rear of the machine. The drive is transmitted from the motor to the constant speed shaft by heavy V belts. *A. C. Wickman, Ltd.*

For more data insert No. 33 on postcard, p. 35.

Dust Collectors

Capacity of two models is 1150 cfm; velocity 5600 fpm with 2 hp motor.

Model CYO-6 illustrated is recommended for installations for exhausting air to the outside. Model CYB-6 is of the same construction



but is fitted with a dust proof bag, and is adaptable where conditions permit recirculating the air. The base measures 26 in. diam; dust pan capacity is 10,620 cu in. Overall height is 86 in., inlet size is 6 in. and outlet, 7 in. *Hammond Machinery Builders, Inc.*

For more data insert No. 34 on postcard, p. 35.

Handi-Crane

Has high lift capacity of 5 tons, easy steering under heavy load.

For fast and economical handling of materials the Model UC crane is mounted on a Minneapolis-

The ABC of MST

Michigan

The Modern Electric Resistance

WELDED

STEEL TUBING

ROUND

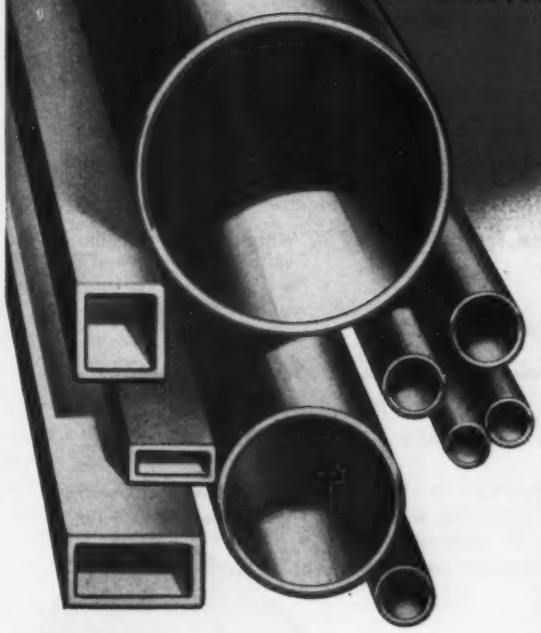
⅛" to 4" O. D. 9 to 22 gauge

SQUARE-RECTANGULAR

½" to 2" 20 gauge

1" to 2½", 14, 16, 18 gauge

A ALWAYS MAKES POSSIBLE
B BETTER PRODUCTS
C AT LOWER COST



Thousands of products, from intricate automobile and truck parts to furniture and vacuum cleaners, are made better and more economically with MICHIGAN TUBING. We invite you to consider the many advantages of using it in the fabrication of *YOUR* product.

A Quality Product, can be worked in your plant or prefabricated by MICHIGAN.

Consult us for engineering and technical help in the selection of tubing best suited to your needs.

Michigan STEEL TUBE PRODUCTS CO.

33 Years in the Business

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FACTORIES: DETROIT, MICHIGAN • SHELBY, OHIO

DISTRIBUTORS: Steel Sales Corp., Detroit, Chicago, St. Louis, Milwaukee, Indianapolis and Minneapolis—Miller Steel Co., Inc., Hillside, N. J.—C. L. Hyland, Dayton, Ohio—Dirks & Company, Portland, Oregon—James J. Shannon, Milton, Mass.—Service Steel Co., Los Angeles, Calif.—American Tubular & Steel Products Co., Pittsburgh, Pa.—Strong, Carlisle & Hammond Co., Cleveland, Ohio—A. J. Fitzgibbons Co., Buffalo, N. Y.

Electro's New STOPPER HEADS

END INTERNAL LEAKAGE-SOURCE CRACKS

Already Proved in Service!

Electro's new Stopper Heads do not develop internal leakage-source cracks. Not one has ever shown spalling cracks or failed during assembly. These new Heads assure cleaner shut-offs, resist abrasion and eliminate sticking at the nozzle. Their hot load-bearing capacity is maximum; and their uniformity and dependability are up to Electro's well-known standard. Every executive concerned with open hearth, steel foundry and electric furnace melting should send now for Bulletin S-750 which gives details.

Electro SINCE 1919

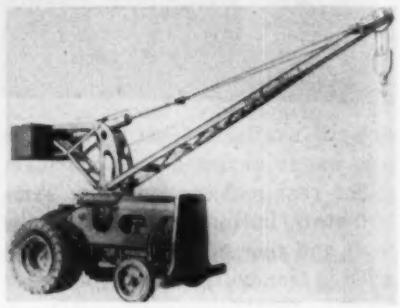
Electro Refractories & Alloys Corporation

WEST COAST WAREHOUSE, LOS ANGELES

344 DELAWARE AVE., BUFFALO 2, N. Y.

STOPPER HEADS • CRUCIBLES • REFRACTORIES, Standard and Special Shapes • HIGH SPEED GRINDING WHEELS • Electro-Carb BRIQUETS for Deoxidation of Metal • POROUS MEDIA • ELECTRO-CARB (Silicon Carbide) ABRASIVE GRAIN

Moline, Model UTI tractor. An 18- or 24-ft boom is raised and lowered by a hydraulic cylinder that allows safe and accurate control independent of any other operation. It rotates a full 320° and has an attached counterweight that permits the load to be swung at a constant



radius with safety. Hydraulic stabilizers on the front end provide additional stability when handling loads over the side. A pintle hook attached can be used for towing service and handling materials. *Clyde Iron Works, Inc.*

For more data insert No. 35 on postcard, p. 35.

Spray Gun for Metals

Designed specifically for spraying of low melting alloys and metals.

Suitable for intermittent or production spraying, the Spray King

has adjustable spray; non-clog, non-drip nozzle; thermostatic control; and lightweight. The capacity of the gun is 7 lb of low melting alloy. *Cooper Alloy Foundry Co.*

For more data insert No. 36 on postcard, p. 35.

Resume Your Reading on Page 39

Briefs and Bulletins

flat-rolled price increases — Effective Sept. 29, Granite City Steel Co. advanced prices $10 per ton. New prices in dollars per 100 lb are: Cold-rolled sheets, $4.80; enameling, $5.10; hot-rolled sheets, $4.05; plates, $4.20; galvanized corrugated steel, $5.10; electrical sheets, $7.40. Sharon Steel Corp. advanced its products an average of 5 pct on Sept. 30. Its prices: hot-rolled strip, sheets and plate, $3.75; hot-rolled alloy strip, $5.45; cold-rolled alloy strip, $10.10; alloy plates, $4.75; high strength low alloy strip, hot-rolled becomes $5.30, with sheets at $5.40; high strength low alloy cold-rolled strip, $6.55; high strength low alloy plates, $5.70; tight cooperage hoops, $3.90. Cold rolled spring steel was increased $7.00 per ton.

out of blast—The 700-ton-per-day Alan Wood blast furnace which was producing pig iron long after it was scheduled to go out of blast, finally went out on Sept. 15 and, when it was cool enough to inspect, it was discovered that just about everything but the hearth floor had built up a ring. This means that the furnace will be out at least until the latter part of this month.

tinplate—Carnegie-Illinois Steel Corp. plans a new tinplate pricing method effective next Jan. 1. Better equipment utilization will be possible under the new system which makes it desirable for consumers to order wider widths through institution of a schedule of deductions on the wider plate. Producers will thus be able to roll more tonnage.

pig iron trend—Koppers Co., Inc., Granite City, has increased its pig iron prices $3 a ton. New prices f.o.b. Granite City are: basic, $50.90; foundry, $51.40, and malleable, $51.90. This is Koppers' first pig iron price increase in more than 2 years.

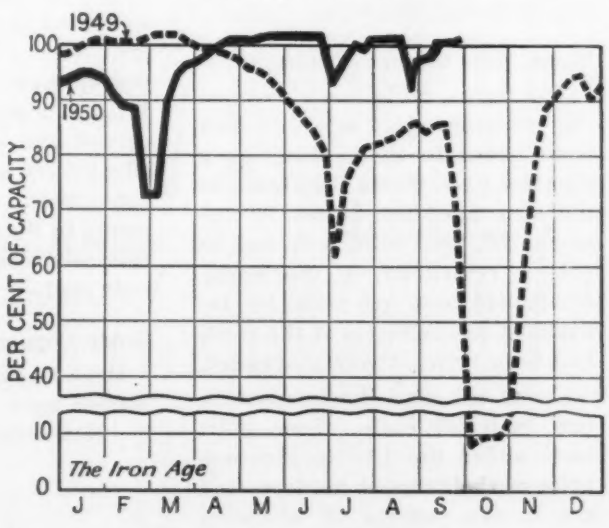
iron pipe advances—Following price advances by all Birmingham merchant iron furnaces the price of cast iron pipe has been raised by $3.50 per net ton. By early this week all major pipe producers were on the new price basis.

coke up—Heavy demand for foundry coke has forced up Connellsville beehive foundry grade 50c to $16.50 to $17.00. Pittsburgh Coke & Chemical Co. advanced the price of foundry oven coke at Neville Island, Pa., $1.00 to $22.00 per net ton, effective Sept. 18. Alabama By-Products reported an increase of 25c per ton in its price of coke raising f.o.b. prices from $19.15 to $19.40 and delivered Birmingham district price from $20.54 to $20.79, effective Oct. 5.

tungsten boost—Ferrotungsten was boosted 25c to $2.50 per lb of contained tungsten and tungsten powder was increased 50c to $3.40 per lb by Electro-Metallurgical Div. of Union Carbon & Carbide Corp. These prices are effective as of Oct. 1 for fourth quarter contracts.

moly mounts—Climax Molybdenum Co. has raised the prices on all the Molybdenum containing materials it produces by 9¢ per lb of contained Molybdenum. The new prices went into effect on Oct. 1.

Steel Operations**



District Operating Rates—Per Cent of Capacity**

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
Sept. 24	97.0*	102.5	93.0	92.0	99.0*	104.0	102.0	104.0	101.0	106.0	89.0	91.5	102.0	100.5
Oct. 1	99.0	103.0	93.0	94.0	98.5	104.0	104.0	104.0	106.0	106.0	85.0	91.5	98.0	101.0

* Revised.
** Steel operations for the first half of 1950 are based on annual capacity of 99,392,800 net tons. Beginning July 1, 1950, operations are based on new annual capacity of 100,563,500 net tons.

Nonferrous Metals OUTLOOK

Market Activities

Other producers follow Alcoa and boost aluminum pigs and ingots 1.50¢ . . . Phelps-Dodge and Kennecott align prices, thus eliminating domestic copper price spread.

New York—The Dow Chemical Co. has announced price increases on magnesium effective Sept. 30. Primary ingots were advanced 2¢ per lb. to 24.50¢ f.o.b. Freeport, Tex., and sticks and alloy ingots were raised by 3¢ per lb.

Aluminum producers are also pushing up their prices. Following the lead set by Aluminum Co. of America, Aluminum Import Corp. and Reynolds Metals Co. have increased their pig and ingot prices 1.5¢ per lb to 18¢ and 19¢ respectively.

At press time it was reported that Kaiser Aluminum and Chemical Corp. was also raising its pig and ingot prices this week. Alcoa has also raised prices on fabricated aluminum products and other producers are expected to revise price lists immediately.

Brass Mills Change Pricing

The brass mills have dropped the supplemental prices which were added to their prices as a separate item. Since Congress has not suspended the 2¢ per lb copper tariff, the mills will not be able to return any of the money which had been set aside for repayment to customers if the tariff had been retroactively suspended.

Citing this and the increase in raw material costs, these mills have added the 1.5¢ to the base price of their copper products and are in the process of adjusting alloy prices. At the same time the mills also raised their scrap buying prices from 1¢ to 2.25¢ a lb on copper and copper containing alloys.

Last week both Phelps-Dodge Corp. and Kennecott Copper Corp. raised their prices of electrolytic copper to basis of 24.50¢ per lb delivered in the Connecticut Valley. This completely eliminated the split-price copper market as far as domestic copper is concerned but with the duty still in effect there are still two prices to consumers. Because of developments in Washington 2 weeks ago, this will continue at least until next year.

Scrap Copper Up Again

Dealers' buying prices for scrap copper have been boosted 1¢ per lb. New prices are: No. 1 heavy copper and wire, 21.5¢ to 22¢; No. 2 heavy copper and wire, 20.5¢ to 21¢; and light copper, 19.5¢ to 20¢. There is little buying for conversion going on at present but the prices were forced up by competition between dealers who are trying to get material that was ordered in September for delivery up to the middle of this month.

There are reports that aluminum scrap is bringing up to 1¢ per lb higher prices in Cleveland and about an average of 1.5¢ per lb more in the Detroit area. Demand for this metal is high in most areas and the price increase in these two centers can be tied in with the increase in primary aluminum prices.

Generally speaking, demand runs high in all metals and supply continues to be tight but, with good news coming steadily from the Korean front, the market has stabilized somewhat and people are breathing a little easier.

MONTHLY AVERAGE PRICES

The average prices of the major nonferrous metals in September based on quotations appearing in THE IRON AGE, were as follows:

	Cents Per Pound
Electrolytic copper, Conn. Valley	23.250
Lake Copper, delivered	24.625
Straits tin, New York	$1.011
Zinc, East St. Louis	17.100
Zinc, New York	17.820
Lead, St. Louis	15.600
Lead, New York	15.800

NONFERROUS METALS PRICES

	Sept. 27	Sept. 28	Sept. 29	Sept. 30	Oct. 2	Oct. 3
Copper, electro, Conn.	22.50–24.50	22.50–24.50	22.50–24.50	22.50–24.50	24.50	24.50
Copper, Lake, delivered	24.625	24.625	24.625	24.625	24.625	24.625
Tin, Straits, New York	$1.035	$1.025	$1.025	....	$1.04	$1.055*
Zinc, East St. Louis	17.50	17.50	17.50	17.50	17.50	17.50
Lead, St. Louis	15.80	15.80	15.80	15.80	15.80	15.80

Note: Quotations are going prices.
***Tentative.**

MILL PRODUCTS

Aluminum

Does not reflect latest increase

(Base prices, cents per pound, base 30,000 lb, f.o.b. shipping point, freight allowed)

Flat Sheet: 0.188 in., 2S, 3S, 27.4¢; 4S, 61S-O, 29.3¢; 52S, 31.4¢; 24S-O, 24S-OAL, 30.3¢; 75S-O, 75S-OAL, 36.8¢; 0.081 in., 2S, 3S, 28.4¢; 4S, 61S-O, 30.7¢; 52S, 32.8¢; 24S-O, 24S-OAL, 31.4¢; 75S-O, 75S-OAL, 38.5¢; 0.032 in., 2S, 3S, 30.0¢; 4S, 61S-O, 34.0¢; 52S, 36.7¢; 24S-O, 24S-OAL, 38.4¢; 75S-O, 75S-OAL, 48.1¢.

Plate: ¼ in., and heavier: 2S, 3S, F, 24.8¢; 4S-F, 27¢; 52S-F, 28.1¢; 61S-O, 27.6¢; 24S-F, 24S-FAL, 28.1¢; 75S-F, 75S-FAL, 34.9¢.

Extruded Solid Shapes: Shape factors 1 to 4, 33.6¢ to 67¢; 11 to 13, 34.3¢ to 79¢; 23 to 25, 36.3¢ to $1.08; 35 to 37, 43.3¢ to $1.66.

Rod Rolled: 1.5 to 4.5 in., 2S-F, 3S-F, 34.5¢ to 31¢; Cold-finished, 0.375 to 3 in., 2S, 3S, 37¢ to 32.5¢.

Screw Machine Stock: Rounds, 11S-T3, R317-T4, ¼ to 11/32 in., 49.5¢ to 38.5¢; ⅜ to 1½ in., 88¢ to 36¢; 1 9/16 to 3 in., 36¢ to 33¢; 17S-T4 lower by 1¢ per lb. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in.; 2S, 36.5¢ to 27¢; 52S, 44.5¢ to 32.5¢; 56S, 47.5¢ to 39¢; 17S-T4, 50.5¢ to 35¢; 61S-T4, 45¢ to 34.5¢; 75S-T6, 76.5¢ to 55.5¢.

Extruded Tubing, Rounds: 63S-T5; OD in in.: 1¼ to 2, 33.5¢ to 49¢; 2 to 4, 30.5¢ to 41.3¢; 4 to 6, 31¢ to 37.8¢; 6 to 9, 31.5¢ to 39.3¢.

Roofing Sheet, Flat: 0.019 in. x 28 in. per sheet, 72 in., $1.085; 96 in., $1.446; 120 in., $1.806; 144 in., $2.170. Gage 0.024 in. x 28 in., 72 in., $1.306; 96 in., $1.743; 120 in., $2.179; 144 in., $2.615. **Coiled Sheet:** 0.019 in. x 28 in., 26.7¢ per lb; 0.024 in. x 28 in., 25.4¢ per lb.

Magnesium

(Cents per lb, f.o.b. mill, freight allowed)

Sheet and Plate: M-O, FS-O. ¼ in. 58¢ to 60¢; 3/16 in. 60¢ to 62¢; ⅛ in. 62¢ to 64¢; B & S gage 10, 63¢ to 65¢; 12, 67¢ to 69¢; 14, 73¢ to 78¢; 16, 80¢ to 85¢; 18, 88¢ to 93¢; 20, $1.00 to $1.05; 22, $1.22-$1.31; 24, $1.62-$1.75. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, FS, diam in., ¼ in. to 0.311, 66¢; ½ in. to ¾, 50¢; 1¼ to 1.749, 47¢; 2½ to 5 in., 45¢. Other alloys higher. Base: Up to ¾ in., diam, 10,000 lb; ¾ in. to 1¾ in., 20,000 lb; 1¾ in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M, FS, in weight per ft, for perimeters of less than size indicated, 0.10 to 0.11 lb per ft, per. up to 3.5 in., 59.5¢; 0.22 to 0.25 lb per ft, per. up to 5.9 in., 55¢; 0.50 to 0.59 lb per ft, per. up to 8.6 in., 50.5¢; 1.8 to 2.59 lb per ft, per. up to 19.5 in., 47.5¢ 4 to 6 lb per ft, per. up to 28 in. 46.5¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ lb to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, FS, wall thickness, outside diam, in., 0.049 to 0.057, ¼ in. to 5/16, $1.40; 5/16 to ⅜, $1.26; ½ to ⅝, 93¢; 1 to 2 in., 76¢; 0.165 to 0.219, ⅝ to ¾, 61¢; 1 to 2 in., 57¢; 3 to 4 in., 56¢. Other alloys higher. Base, OD in in.: Up to 1½ in., 10,000 lb; 1½ in. to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

Nickel and Monel

(Base prices, cents per lb, f.o.b. mill)

	"A" Nickel	Monel
Sheets, cold-rolled	69	53
Strip, cold-rolled	75	56
Rods and bars	65	51
Angles, hot-rolled	65	51
Plates	67	52
Seamless tubes	98	86
Shot and blocks	..	46

Copper, Brass, Bronze

(Cents per lb, freight prepaid on 200 lb, subject to copper import duty)

	Sheets	Rods	Extruded Shapes
Copper	40.93	....	40.53
Copper, h-r	....	36.78	....
Copper, drawn	....	38.03	....
Low brass	38.92	38.61	....
Yellow brass	37.53	37.22	....
Red brass	39.39	39.08	....
Naval brass	42.33	36.39	37.65
Leaded brass	....	31.88	35.95
Com'l bronze	40.38	40.07	....
Manganese bronze	45.96	39.85	41.41
Phosphor bronze	59.45	59.70	....
Muntz metal	40.43	35.99	37.24
Everdur, Herculoy, Olympic, etc.	43.97	42.91	....
Nickel silver 10 pct	48.52	50.74	....
Arch. bronze	....	....	35.11

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	19.00
Aluminum pig	18.00
Antimony, American, Laredo, Tex.	32.00
Beryllium metal, 95%, lumps, beads	$95.00
Beryllium copper, 3.75-4.25% Be, dollars per lb contained Be	$30.00
Beryllium aluminum 5% Be, dollars per lb contained Be	$65.00
Bismuth, ton lots	$2.00
Cadmium, del'd	$2.40
Cobalt, 97-99% (per lb)	$1.80 to $1.87
Copper, electro, Conn. Valley	24.50
Copper, Lake, delivered	24.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$220
Lead St. Louis	15.80
Lead, New York	16.00
Magnesium, 99.8+%, f.o.b. Freeport Tex., 10,000 lb	24.50
Magnesium, sticks, 100 to 500 lb	42.00 to 44.00
Mercury, dollars per 76-lb flask f.o.b. New York	$85 to $87
Nickel, electro, f.o.b. New York	51.22
Nickel oxide sinter, f.o.b. Copper Cliff, Ont., contained nickel	44.25
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$100 to $103
Silver, New York, cents per oz.	72.75
Tin, New York	$1.055
Zinc, East St. Louis	17.50
Zinc, New York	18.22
Zirconium copper, 50 pct	$6.20

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5-5 ingot	
No. 115	25.50
No. 120	25.00
No. 123	24.50
80-10-10 ingot	
No. 305	29.50
No. 315	27.00
88-10-2 ingot	
No. 210	40.00
No. 215	37.00
No. 245	31.00
Yellow ingot	
No. 405	21.75
Manganese bronze	
No. 421	29.00

Aluminum Ingot

(Cents per lb, 30,000 lb lots)

95-5 aluminum-silicon alloys	
0.30 copper, max.	29.00-29.50
0.60 copper, max.	28.50-29.00
Piston alloys (No. 122 type)	27.00-27.50
No. 12 alum. (No. 2 grade)	26.50-27.00
108 alloy	27.00-27.50
195 alloy	28.00-28.50
13 alloy	28.50-29.00
AXS-679	27.50-28.00

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97½%	27.50-28.00
Grade 2—92-95%	26.50-27.00
Grade 3—90-92%	25.50-26.00
Grade 4—85-90%	25.00-25.50

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, in 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	39⅛
Electrodeposited	33⅜
Rolled, oval, straight, delivered	38⅞
Forged ball anodes	43
Brass, 80-20	
Cast, oval, 15 in. or longer	34¾
Zinc, oval	26½
Ball anodes	25½
Nickel 99 pct plus	
Cast	68.00
Rolled, depolarized	69.00
Cadmium	$2.55
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.	79½

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	52.15
Copper sulfate, 99.5 crystals, bbl.	12.85
Nickel salts, single or double, 4-100 lb bags, frt allowed	20½
Nickel chloride, 375 lb drum	27½
Silver cyanide, 100 oz lots, per oz	61¼
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc cyanide, 100 lb drums	45.85

SCRAP METALS

Brass Mill Scrap

(Cents per pound; add ½¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	23	22¼
Yellow brass	20⅛	18⅝
Red brass	21½	20⅝
Comm. bronze	21⅜	21
Mang. bronze	19½	18⅝
Brass rod ends	19⅞	....

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	21.75
No. 2 copper wire	20.75
Light copper	19.75
Refinery brass	20.00*
Radiators	15.50

*Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer)

No. 1 copper wire	21.75
No. 2 copper wire	20.75
Light copper	19.75
No. 1 composition	19.00
No. 1 comp. turnings	18.75
Rolled brass	17.00
Brass pipe	18.50
Radiators	15.50
Heavy yellow brass	14.50-14.75
Aluminum	
Mixed old cast	16.00
Mixed old clips	16.50
Mixed turnings, dry	15.50
Pots and pans	16.00
Low copper	18.50

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	21½—22
No. 2 heavy copper and wire	20½—21
Light copper	19½—20
Auto radiators (unsweated)	13¾—14
No. 1 composition	17 —17½
No. 1 composition turnings	16½—17
Clean red car boxes	15 —15½
Cocks and faucets	15 —15½
Mixed heavy yellow brass	12 —12½
Old rolled brass	13¼—13¾
Brass pipe	15½—16
New soft brass clippings	17 —17½
Brass rod ends	15¾—16
No. 1 brass rod turnings	15½—15¾

Aluminum

Alum. pistons and struts	9½—10
Aluminum crankcases	12 —12½
2S aluminum clippings	15 —15½
Old sheet and utensils	12 —12½
Borings and turnings	8½
Misc. cast aluminum	12 —12½
Dural clips (24S)	12 —12½

Zinc

New zinc clippings	13½—14
Old zinc	11¼—11½
Zinc routings	8¼— 8¾
Old die cast scrap	8¼— 8¾

Nickel and Monel

Pure nickel clippings	50 —60
Clean nickel turnings	47 —57
Nickel anodes	50 —60
Nickel rod ends	50 —60
New Monel Clippings	17 —21
Clean Monel turnings	15 —17
Old sheet Monel	16 —20
Inconel clippings	22 —26
Nickel silver clippings, mixed	13 —14
Nickel silver turnings, mixed	12 —13

Lead

Soft scrap, lead	13½—14
Battery plates (dry)	8 — 8¼

Magnesium

Segregated solids	9 —10
Castings	5½— 6½

Miscellaneous

Block tin	78 —80
No. 1 pewter	58 —60
No. 1 auto babbitt	50 —52
Mixed common babbitt	13 —13½
Solder joints	16½—17
Siphon tops	46 —48
Small foundry type	16½—17
Monotype	15½—16
Lino. and stereotype	14½—15
Electrotype	13¾—14¼
New type shell cuttings	18 —18½
Hand picked type shells	6½— 7
Lino. and stereo. dross	4¾— 5¼
Electro. dross	3¼— 3½

MARKETS—PRICES—TRENDS

SCRAP
Iron & Steel

Formula Price Front Stays Intact

The mills held a dogged and still successful formula price grip in all scrap centers this week although in Cincinnati and Cleveland mills had to raise their offers to keep scrap moving. In Cleveland, the price of No. 1 advanced from $41.00 to $41.50 to a new spread of $43.00 to $43.50. No. 1 climbed $1.00 in Cincinnati. The market was strong in both centers on nearly all items.

Railroad grades were strong in Pittsburgh, Chicago, and Philadelphia, showing gains of $1.00 and $2.00. Pittsburgh brokers reported that they were still able to buy No. 1 heavy melting under the $44.00 formula but that many old orders were outstanding at higher prices.

Feeling was smoldering in Chicago that the formula front would not be able to endure much longer on the heavy grades. Nevertheless formula prices were held there this week. Machine shop turnings moved up $2.50 to a $32.00 top and shoveling turnings advanced $2.00.

PITTSBURGH—Brokers say they are still able to buy No. 1 heavy melting steel at prices under the $44.00 "formula" delivered price here. There are plenty of old orders outstanding, however, at higher prices. These old orders are expected to be cleared up soon—probably this month. Machine shop turnings were stronger, up 50¢. Cast iron borings were up $1.00. Railroad specialties were bringing $54.00, an advance of $1.00. Cast grades, reflecting the shortage of pig iron, were stronger.

CHICAGO—A sale of short shoveling turnings at $34.00 per gross ton has been reported in the Chicago area last week but has not been officially confirmed. However, brokers are offering prices consistent with his consumer price. Machine shop turnings and mixed borings and turnings are both up to $32.00 per gross ton on the basis of recent sales. Cast iron borings are quotable at $33.00 per gross ton. While some brokers have been offering $40.00 for No. 1 steel, some are now offering $38.00 for No. 2 heavy melting. It is felt that the formula prices won't be able to hold much longer on openhearth grades. As yet no mill has bought over the formula price.

PHILADELPHIA—Formula prices continue to hold in this market on steelmaking grades. Low phos material is a bit higher and the foundry grades are still on the way up in price. Rail crops are up $2.00 per ton but the market conditions are such that almost any price will bring buyers. Rail specialties are scarce and cast material is becoming increasingly tougher to get.

NEW YORK—Steelmaking grades clung to formula front prices in a market that showed strength in all directions. Movement of scrap however was not reported as anything sensational and one source said that scrap was scarce. The turnings group extended its show of strength from last week and prices of all three items were fattened by 50¢. The cast iron group remained as strong as ever but held at last week's level.

DETROIT—With mills holding tenaciously to the price line established several weeks ago, Detroit quotations for mill grades are unchanged this week. At the moment there are no indications of an early break in prices here although the strong undertone continues and some dealer resistance is developing. Meanwhile, cast grades are very strong and recent purchases have been at prices $2.00 above last week's quotations. The shortage of coke has added to the necessity of using hand picked scrap in cupolas.

CLEVELAND—Mills bought at the formula prices of $43.50 in Cleveland last week, and in the Valley, the formula for blast furnace grades was raised to $38.00. Brokers believe the trade is on the verge of two markets, one involving allocated tonnage, and the other for dealer grades. No. 1 heavy melting steel is very scarce, and reports that it is going for low phos. Upgrading in general is also reported. Foundry grades are strong.

ST. LOUIS—Openhearth grades of scrap iron are reported to be in light supply, shipments falling off because of slow deliveries by truckers to city markets. Consumers are out of the market as a result of commitments for October delivery. Because of higher prices of pig iron, there is greater buying activity by foundries. Shoveling turnings are up $1.00 on outside buying.

CINCINNATI—One major consumer raised buying prices on openhearth and electric furnace grades this week in a strong market here. Tonnage has not been moving freely at quoted prices, and shipments in some cases consisted chiefly of odd cars that brokers picked up here and there. Higher prices have brought out some tonnage but some dealers are still reluctant to sell. Foundry grades are very strong and top grades are bringing premium prices.

BOSTON—A $3.00 a ton rise in No. 1 machinery cast featured the market here which had a good overall tone. No. 1 heavy melting was up 50¢ a ton, along with some other steelmaking grades. Reason for the jump in good cast scrap is buying by some Pennsylvania foundries.

BIRMINGHAM—Demand for scrap in several categories remains strong, but both brokers and buyers are opposing any further increases in price and they are continuing steady. Scrap is entering the district from as far away as Texas and Oklahoma.

TORONTO—While scrap steel prices remain unchanged with heavy melting steel $30.00 per gross ton delivered Hamilton, No. 1 cast scrap has been marked up $5.00 and now stands at $45.00 per ton delivered to consumer.

BUFFALO—Strength in outside markets was partly responsible for additional gains of $1.00 to $2.00 a ton in the cast market. Higher prices in nearby markets might make it profitable even after freight deductions to make purchases here. Steel grades remained nominally unchanged at formula levels, but smaller consumers are reportedly paying more. Turnings advanced $1.00 to $2.00 a ton on sales made at the falls.

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COMMON SCREWDRIVER

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. . . RECESSED HEADS AS WELL AS SLOTTED

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UNITED SCREW AND BOLT CORPORATION

CLEVELAND 2 CHICAGO 8 NEW YORK 7

Iron and Steel

SCRAP PRICES

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$43.50 to $44.00
No. 2 hvy. melting	39.00 to 39.50
No. 1 bundles	45.50 to 46.00
No. 2 bundles	38.50 to 39.00
Machine shop turn.	34.00 to 34.50
Mixed bor. and ms. turns.	34.00 to 34.50
Shoveling turnings	37.50 to 38.00
Cast iron borings	36.50 to 37.00
Low phos. plate	49.50 to 50.00
Heavy turnings	42.50 to 43.00
No. 1 RR. hvy. melting	44.00 to 45.00
Scrap rails, random lgth.	52.50 to 53.00
Rails 2 ft and under	55.00 to 56.00
RR. steel wheels	53.00 to 54.00
RR. spring steel	53.00 to 54.00
RR. couplers and knuckles	53.00 to 54.00
No. 1 machinery cast	52.50 to 53.00
Mixed yard cast.	47.50 to 48.00
Heavy breakable cast.	41.50 to 42.00
Malleable	57.00 to 58.00

Chicago

No. 1 hvy. melting	$39.50 to $40.00
No. 2 hvy. melting	37.50 to 38.00
No. 1 factory bundles	39.50 to 40.00
No. 1 dealers' bundles	39.50 to 40.00
No. 2 dealers' bundles	34.00 to 35.00
Machine shop turn.	31.00 to 32.00
Mixed bor. and turn.	31.00 to 32.00
Shoveling turnings	33.00 to 34.00
Cast iron borings	32.00 to 33.00
Low phos. forge crops	49.00 to 50.00
Low phos. plate	48.00 to 49.00
No. 1 RR. hvy. melting	43.50 to 44.50
Scrap rails, random lgth.	55.00 to 56.00
Rerolling rails	60.00 to 61.00
Rails 2 ft and under	61.50 to 62.50
Locomotive tires, cut	51.00 to 52.00
Cut bolsters & side frames	47.00 to 48.00
Angles and splice bars	56.00 to 57.00
RR. steel car axles	74.00 to 75.00
RR. couplers and knuckles	49.00 to 50.00
No. 1 machinery cast.	50.00 to 51.00
No. 1 agricul. cast.	46.00 to 47.00
Heavy breakable cast.	38.00 to 39.00
RR. grate bars	38.00 to 39.00
Cast iron brake shoes	41.00 to 42.00
Cast iron car wheels	42.00 to 43.00
Malleable	57.00 to 58.00

Philadelphia

No. 1 hvy. melting	$38.00 to $39.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 bundles	38.00 to 39.00
No. 2 bundles	31.00 to 32.00
Machine shop turn.	27.00 to 28.00
Mixed bor. and turn.	25.00 to 26.00
Shoveling turnings	32.00 to 33.00
Low phos. punchings, plate	45.00 to 46.00
Low phos. 5 ft and under	44.00 to 45.00
Low phos. bundles	41.00 to 42.00
Hvy. axle forge turn.	38.00 to 39.00
Clean cast chem. borings	39.00 to 40.00
RR. steel wheels	47.00 to 48.00
RR. spring steel	47.00 to 48.00
Rails 18 in. and under	55.00 to 56.00
No. 1 machinery cast.	48.00 to 49.00
Mixed yard cast.	41.00 to 42.00
Heavy breakable cast.	41.00 to 42.00
Cast iron carwheels	48.00 to 49.00
Malleable	53.00 to 55.00

Cleveland

No. 1 hvy. melting	$43.00 to $43.50
No. 2 hvy. melting	40.00 to 40.50
No. 1 busheling	43.00 to 43.50
No. 1 bundles	43.00 to 43.50
No. 2 bundles	28.00 to 28.50
Machine shop turn.	35.00 to 35.50
Mixed bor. and turn.	36.00 to 36.50
Shoveling turnings	37.00 to 37.50
Cast iron borings	37.00 to 37.50
Low phos. 2 ft and under	45.50 to 46.00
Steel axle turn.	43.00 to 43.50
Drop forge flashings	43.00 to 43.50
No. 1 RR. hvy. melting	43.50 to 44.00
Rails 3 ft and under	63.00 to 63.50
Rails 18 in. and under	64.00 to 64.50
No. 1 machinery cast.	53.00 to 54.00
RR cast.	53.00 to 54.00
RR. grate bars	43.00 to 44.00
Stove plate	47.00 to 48.00
Malleable	65.00 to 66.00

Youngstown

No. 1 hvy. melting	$43.50 to $44.00
No. 2 hvy. melting	40.50 to 41.00
No. 1 bundles	43.50 to 44.00
No. 2 bundles	$38.50 to $39.00
Machine shop turn.	35.50 to 36.00
Shoveling turnings	37.50 to 38.00
Cast iron borings	37.50 to 38.00
Low phos. plate	46.00 to 46.50

Buffalo

No. 1 hvy. melting	$41.00 to $42.00
No 2 hvy. melting	37.50 to 38.50
No 1 busheling	37.50 to 38.50
No. 1 bundles	39.50 to 40.00
No. 2 bundles	36.00 to 36.50
Machine shop turn.	31.50 to 32.50
Mixed bor. and turn.	31.50 to 32.50
Shoveling turnings	33.50 to 34.50
Cast iron borings	31.50 to 32.50
Low phos. plate	42.00 to 43.00
Scrap rails, random lgth.	44.00 to 45.00
Rails 2 ft and under	48.00 to 50.00
RR. steel wheels	47.00 to 48.00
RR. spring steel	47.00 to 48.00
RR. couplers and knuckles	47.00 to 48.00
No. 1 machinery cast.	46.00 to 47.00
No. 1 cupola cast.	42.00 to 43.00
Small indus. malleable	48.00 to 50.00

Birmingham

No. 1 hvy. melting	$34.50 to $35.00
No. 2 hvy. melting	31.00 to 32.00
No. 2 bundles	29.00 to 30.00
No. 1 busheling	31.00 to 32.00
Machine shop turn.	27.00 to 28.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	25.00 to 26.00
Bar crops and plate	41.00 to 42.00
Structural and plate	41.00 to 42.00
No. 1 RR. hvy. melting	40.00 to 41.00
Scrap rails, random lgth.	43.00 to 44.00
Rerolling rails	48.00 to 49.00
Rails 2 ft and under	48.00 to 49.00
Angles & splice bars	47.00 to 48.00
Std. steel axles	44.00 to 45.00
No. 1 cupola cast.	51.00 to 52.00
Stove plate	46.00 to 47.00
Cast iron carwheels	37.00 to 38.00

St. Louis

No. 1 hvy. melting	$39.00 to $40.00
No. 2 hvy. melting	36.00 to 37.00
No. 2 bundled sheets	34.00 to 35.00
Machine shop turn.	27.50 to 28.50
Shoveling turnings	30.00 to 31.00
Rails, random lengths	50.00 to 51.00
Rails 3 ft and under	54.00 to 56.00
Locomotive tires, uncut	47.00 to 48.00
Angles and splice bars	54.00 to 55.00
Std. steel car axles	76.00 to 78.00
RR. spring steel	49.00 to 50.00
No. 1 machinery cast.	46.00 to 48.00
Hvy. breakable cast.	40.00 to 42.00
Cast iron brake shoes	45.00 to 46.00
Stove plate	38.00 to 39.00
Cast iron car wheels	48.00 to 49.00
Malleable	53.00 to 55.00

New York

Brokers' buying prices per gross ton, on cars:

No. 1 hvy.melting	$32.50 to $33.00
No. 2 hvy. melting	29.00 to 30.00
No. 2 bundles	28.00 to 28.50
Machine shop turn.	23.50 to 24.50
Mixed bor. and turn.	23.50 to 24.50
Shoveling turnings	26.00 to 27.00
Clean cast chem. bor.	34.00 to 35.00
No. 1 machinery cast.	36.00 to 37.00
Mixed yard cast.	34.00 to 35.00
Charging box cast.	34.00 to 35.00
Heavy breakable cast.	34.00 to 35.00
Unstrp. motor blocks	30.00 to 31.00

Boston

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$32.50
No. 2 hvy. melting	$27.00 to 27.50
No. 1 bundles	32.50
No. 2 bundles	$26.50 to $27.00
Machine shop turn.	22.50 to 23.00
Mixed bor. and turn.	22.00 to 22.50
Shoveling turnings	24.50 to 25.00
No. 1 busheling	31.50 to 32.00
Clean cast chem. borings	29.00 to 30.00
No. 1 machinery cast.	38.00 to 39.00
Mixed cupola cast.	34.00 to 34.50
Heavy breakable cast.	31.50 to 32.00
Stove plate	31.50 to 32.00

Detroit

Brokers' buying prices per gross ton, on cars

No. 1 hvy. melting	$37.00 to $37.50
No. 2 hvy. melting	30.00 to 31.00
No. 1 bundles	37.00 to 37.50
New busheling	37.00 to 37.50
Flashings	37.00 to 37.50
Machine shop turn.	29.00 to 29.50
Mixed bor. and turn.	29.00 to 29.50
Shoveling turnings	31.00 to 31.50
Cast iron borings	31.00 to 31.50
Low phos. plate	39.00 to 40.00
No. 1 cupola cast.	44.00 to 45.00
Heavy breakable cast.	37.00 to 38.00
Stove plate	38.00 to 39.00
Automotive cast.	47.00 to 48.00

Cincinnati

Per gross ton, f.o.b. cars:

No. 1 hvy. melting	$42.50 to $43.00
No. 2 hvy. melting	37.50 to 38.00
No. 1 bundles	42.50 to 43.00
No. 2 bundles, black	37.50 to 38.00
No. 2 bundles, mixed	27.50 to 28.00
Machine shop turn.	26.50 to 27.00
Mixed bor. and turn.	28.50 to 29.00
Shoveling turnings	29.50 to 30.00
Cast iron borings	29.50 to 30.00
Low phos. 18 in. under	52.00 to 53.00
Rails, random lengths	55.00 to 56.00
Rails, 18 in. and under	62.00 to 63.00
No. 1 cupola cast.	54.00 to 55.00
Hvy. breakable cast.	46.00 to 47.00
Drop broken cast.	57.00 to 58.00

San Francisco

No. 1 hvy. melting	$26.50
No. 2 hvy. melting	24.50
No. 1 bundles	26.50
No. 2 bundles	22.50
No. 3 bundles	19.50
Machine shop turn.	13.00
Elec. fur. 1 ft and under	36.00
No. 1 RR. hvy. melting	26.50
Scrap rails, random lgth.	26.50
No. 1 cupola cast.	$43.00 to 46.00

Los Angeles

No. 1 hvy. melting	$26.50
No. 2 hvy. melting	24.50
No. 1 bundles	26.50
No. 2 bundles	22.50
No. 3 bundles	19.50
Mach. shop turn.	13.00
Elec. fur. 1 ft and under	38.00
No. 1 RR. hvy. melting	26.50
Scrap rails, random lgth.	26.50
No. 1 cupola cast.	$43.00 to 45.00

Seattle

No. 1 hvy. melting	$24.00
No. 2 hvy. melting	24.00
No. 1 bundles	22.00
No. 2 bundles	22.00
No. 3 bundles	18.00
Elec. fur. 1 ft and under	$29.00 to 30.00
RR. hvy. melting	25.00
No. 1 cupola cast	35.00
Heavy breakable cast.	35.00

Hamilton, Ont.

No. 1 hvy. melting	$30.00
No. 1 bundles	30.00
No. 2 bundles	29.50
Mechanical bundles	28.00
Mixed steel scrap	26.00
Mixed bor. and turn.	23.00
Rails, remelting	30.00
Rails, rerolling	33.00
Bushelings	24.50
Bush., new fact, prep'd	29.00
Bush., new fact, unprep'd.	23.00
Short steel turnings	23.00
Cast scrap	45.00

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Comparison of Prices

Steel prices in this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel (cents per pound)	Oct. 3, 1950	Sept. 26, 1950	Sept. 5, 1950	Oct. 4 1949
Hot-rolled sheets	3.35	3.35	3.35	3.25
Cold-rolled sheets	4.10	4.10	4.10	4.00
Galvanized sheets (10 ga)	4.40	4.40	4.40	4.40
Hot-rolled strip	3.25	3.25	3.25	3.25
Cold-rolled strip	4.21	4.21	4.21	4.038
Plate	3.50	3.50	3.50	3.40
Plates wrought iron	7.85	7.85	7.85	7.85
Stains C-R strip (No. 302)	34.50	34.50	34.50	33.00
Tin and Terneplate: (dollars per base box)				
Tinplate (1.50 lb) cokes.	$7.50	$7.50	$7.50	$7.75
Tinplate, electro (0.50 lb)	6.60	6.60	6.60	6.70
Special coated mfg. ternes	6.35	6.35	6.35	6.65
Bars and Shapes: (cents per pound)				
Merchant bars	3.45	3.45	3.45	3.35
Cold-finished bars	4.145	4.145	4.145	3.995
Alloy bars	3.95	3.95	3.95	3.75
Structural shapes	3.40	3.40	3.40	3.25
Stainless bars (No. 302)	30.00	30.00	30.00	28.50
Wrought iron bars	9.50	9.50	9.50	9.50
Wire: (cents per pound)				
Bright wire	4.50	4.50	4.50	4.15
Rails: (dollars per 100 lb)				
Heavy rails	$3.40	$3.40	$3.40	$3.20
Light rails	3.75	3.75	3.75	3.55
Semifinished Steel: (dollars per net ton)				
Rerolling billets	$54.00	$54.00	$54.00	$52.00
Slabs, rerolling	54.00	54.00	54.00	52.00
Forging billets	63.00	63.00	63.00	61.00
Alloy blooms, billets, slabs	66.00	66.00	66.00	63.00
Wire Rod and Skelp: (cents per pound)				
Wire rods	3.85	3.85	3.85	3.40
Skelp	3.15	3.15	3.15	3.25

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Pig Iron: (per gross ton)	Oct. 3, 1950	Sept. 26, 1950	Sept. 5, 1950	Oct. 4 1949
No. 2, foundry, del'd Phila.	$51.76	$51.76	$51.76	$50.42
No. 2, Valley furnace	49.50	49.50	46.50	46.50
No. 2, Southern Cin'ti	52.58	50.25	49.08	46.08
No. 2, Birmingham	45.88	43.55	42.38	39.38
No. 2, foundry, Chicago†	49.50	49.50	46.50	46.50
Basic del'd Philadelphia	50.92	50.92	50.92	49.92
Basic, Valley furnace	49.00	49.00	46.00	46.00
Malleable, Chicago†	49.50	49.50	46.50	46.50
Malleable, Valley	49.50	49.50	46.50	46.50
Charcoal, Chicago	72.56	72.56	68.56	68.56
Ferromanganese‡	173.40	173.40	173.40	173.40

†The switching charge for delivery to foundries in the Chicago district is $1 per ton.
‡Average of U. S. prices quoted on Ferroalloy page.

Scrap: (per gross ton)				
Heavy melt'g steel, P'gh.	$43.75	$43.75	$43.75	$29.75
Heavy melt'g steel, Phila.	38.50	38.50	38.50	25.50
Heavy melt'g steel, Ch'go	39.75	39.75	39.50	25.50
No. 1 hy. com. sh't, Det.	37.25	37.25	37.50	22.50
Low phos. Young'n	46.25	46.25	46.25	31.75
No. 1 cast, Pittsburgh	52.75	51.75	48.75	39.50
No. 1 cast, Philadelphia	48.50	46.50	44.50	39.00
No. 1 cast, Chicago	50.50	50.50	50.50	40.50
Coke: Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.25	$14.25	$14.25	$14.25
Foundry coke, prompt	16.75	16.25	16.25	15.75
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro, Conn.	24.50	23.80	22.60	17.625
Copper, Lake, Conn.	24.625	24.625	24.625	17.75
Tin, Straits, New York	1.055†	$1.04*	95.50*	96.00
Zinc, East St. Louis	17.50	17.50	15.00	9.25
Lead, St. Louis	15.80	15.80	14.80	14.05
Aluminum, virgin	19.00	18.25	17.50	17.00
Nickel, electrolytic	51.22	51.22	51.22	42.93
Magnesium, ingot	24.50	22.50	22.50	20.50
Antimony, Laredo, Tex.	32.00	32.00	28.50	38.50

†Tentative. *Revised.

Composite Prices

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1949, issue.)

Finished Steel Base Price

Oct. 3, 1950 ..... 3.837¢ per lb.
One week ago ..... 3.837¢ per lb.
One month ago ..... 3.837¢ per lb.
One year ago ..... 3.705¢ per lb.

	High	Low
1950	3.837¢ Jan. 3	3.837¢ Jan. 3
1949	3.837¢ Dec. 27	3.3705¢ May 3
1948	3.721¢ July 27	3.193¢ Jan. 1
1947	3.193¢ July 29	2.848¢ Jan. 1
1946	2.848¢ Dec. 31	2.464¢ Jan. 1
1945	2.464¢ May 29	2.396¢ Jan. 1
1944	2.396¢	2.396¢
1943	2.396¢	2.396¢
1942	2.396¢	2.396¢
1941	2.396¢	2.396¢
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16
1939	2.35367¢ Jan. 3	2.26689¢ May 16
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10
1935	2.07542¢ Oct. 1	2.06492¢ Jan. 8
1932	1.89196¢ July 5	1.83910¢ Mar. 1
1929	2.31773¢ May 28	2.26498¢ Oct. 29

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Pig Iron

.... $49.19 per gross ton....
.... 48.80 per gross ton....
.... 46.61 per gross ton....
.... 45.88 per gross ton....

High	Low
$49.19 Oct. 3	$45.88 Jan 3
46.87 Jan. 18	45.88 Sept. 6
46.91 Oct. 12	39.58 Jan. 6
37.98 Dec. 30	30.14 Jan. 7
30.14 Dec. 10	25.37 Jan. 1
25.37 Oct. 23	23.61 Jan. 2
$23.61	$23.61
23.61	23.61
23.61	23.61
$23.61 Mar. 20	$23.45 Jan. 2
23.45 Dec. 23	22.61 Jan. 2
22.61 Sept. 19	20.61 Sept.12
23.25 June 21	19.61 July 6
32.25 Mar. 9	20.25 Feb. 16
19.74 Nov. 24	18.73 Aug. 11
18.84 Nov. 5	17.83 May 14
14.81 Jan. 5	13.56 Dec. 6
18.71 May 14	18.21 Dec. 17

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Scrap Steel

..... $40.67 per gross ton.....
..... 40.67 per gross ton.....
..... 40.58 per gross ton.....
..... 26.92 per gross ton.....

High	Low
$41.58 Aug. 22	$26.25 Jan. 3
43.00 Jan. 4	19.33 June 28
43.16 July 27	39.75 Mar. 9
42.58 Oct. 28	29.50 May 20
31.17 Dec. 24	19.17 Jan. 1
19.17 Jan. 2	18.92 May 22
19.17 Jan. 11	15.76 Oct. 24
$19.17	$19.17
19.17	19.17
$22.00 Jan. 7	$19.17 Apr. 10
21.83 Dec. 30	16.04 Apr. 9
22.50 Oct. 3	14.08 May 16
15.00 Nov. 22	11.00 June 7
21.92 Mar. 30	12.67 June 9
17.75 Dec. 21	12.67 June 8
13.42 Dec. 10	10.33 Apr. 29
8.50 Jan. 12	6.43 July 5
17.58 Jan. 29	14.08 Dec. 8

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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IRON AGE

STEEL PRICES

Smaller numbers in price boxes indicate producing companies. For main office locations, see key on facing page.
Base prices at producing points apply only to sizes and grades produced in these areas. Prices are in cents per lb unless otherwise noted. Extras apply.

	Pittsburgh	Chicago	Gary	Cleveland	Canton Massillon	Middletown	Youngstown	Bethlehem	Buffalo	Conshohocken	Johnstown	Sparrows Point	Granite City	Detroit
INGOTS Carbon forging, net ton	$50.00[1]													$50.00[3]
Alloy, net ton	$51.00[1,17]													$51.00[31]
BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton	$53.00[1]	$53.00[1]	$53.00[1]				$57.00[13]		$53.00[3]	$62.00[26]	$53.00[3]			
Carbon forging billets, net ton	$63.00[1]	$63.00[1,4]	$63.00[1,8]	$63.00[4]			$63.00[23]		$63.00[3,4]	$68.00[26]	$63.00[3]			$66.00[31]
Alloy, net ton	$66.00[1,17]	$66.00[1,4]	$66.00[1]		$66.00[4,42]		$66.00[13]	$66.00[3]	$66.00[3,4]	$70.00[26]	$66.00[3]			$69.00[31]
PIPE SKELP	3.15[1]						3.15[1,4]							
WIRE RODS	3.85[2,18]	3.85[2,4,33]	3.85[6]	3.85[2]			3.85[9]				3.85[3]	3.95[3]		
SHEETS Hot-rolled (18 ga. & hvr.)	3.35[1,5,9,15]	3.35[23]	3.35[1,6,8]	3.35[4,5]			3.35[1,4,6] 3.75[13]		3.35[3]	3.60[26]		3.35[3]	4.05[22]	3.55[12] 4.15[47]
Cold-rolled	4.10[1,5,7,9,15] 5.10[63]		4.10[1,6,8]	4.10[4,5]		4.10[7]	4.10[4,6]		4.10[3]			4.10[3]	4.80[22]	4.30[12]
Galvanized (10 gage)	4.40[1,9,15]		4.40[1,8]		4.40[4]		4.85[64] 4.75[44]					4.40[3]		
Enameling (12 gage)	4.40[1]		4.40[1,8]	4.40[4]		4.40[7]	4.40[6] 4.90[76]						5.10[22]	4.70[12]
Long ternes (10 gage)	4.80[9,15]		4.80[1]			4.80[7]	4.80[64]							
Hi Str. low alloy, h.r.	5.05[1,5,9]	5.05[1]	5.05[1,6,8]	5.05[4,5]			5.05[1,4,6] 5.40[13]		5.05[3]	5.05[26]		5.05[3]		5.25[12]
Hi str. low alloy, c.r.	6.20[1,5,9]		6.20[1,6,8]	6.20[4,5]			6.20[4,6,13]		6.20[3]			6.20[3]		6.40[12]
Hi str. low alloy, galv.	6.75[1]											6.75[3]		
STRIP Hot-rolled	3.25[5,7,9] 3.50[28,41]	3.25[3,66]	3.25[1,6,8]	3.25[5]			3.25[1,4,6] 3.75[13]		3.25[3]	3.50[26]		3.25[3]		3.45[12] 4.05[47]
Cold-rolled	4.15[5,7,9] 4.50[63]	4.30[8] 4.50[66]	4.30[8]	4.15[2,5]		4.15[7]	4.15[4,6,48,49] 4.50[13,40]		4.15[3]			4.15[3]		4.35[12] 4.75[68,81] 4.95[47]
Hi str. low alloy, h.r.	4.95[9]		4.95[1,6,8]	4.95[5]			4.95[1,4,6] 5.30[13]		4.95[3]	4.95[26]		4.95[3]		5.15[12]
Hi Str. low alloy, c.r.	6.20[9]			6.20[2,5]			6.20[4,6] 6.55[13]		6.40[3]			6.40[3]		6.40[12]
TINPLATE† Cokes, 1.50-lb base box 1.25 lb, deduct 20¢	$7.50[1,5,9,15]		$7.50[1,6,8]				$7.50[4]					$7.60[3]	$7.70[22]	
Electrolytic 0.25, 0.50, 0.75 lb box	Deduct $1.15, 90¢ and 65¢ respectively from 1.50-lb coke base box price													
BLACKPLATE, 29 gage Hollowware enameling	5.30[1,5,15]		5.30[1,6]				5.30[4]					5.40[3]	5.50[22]	
BARS Carbon steel	3.45[1,5,9]	3.45[1,4,23]	3.45[1,6,8]	3.45[4]	3.45[4]		3.45[1,4,6]		3.45[3,4]		3.45[3]			3.65[12]
Reinforcing‡	3.45[1,5]	3.45[4]	3.45[1,6,8]	3.45[4]			3.45[1,4,6]		3.45[3,4]		3.45[3]	3.45[3]		
Cold-finished	4.10[5] 4.15[2,4,17,52,69,71]	4.15[2,23,69,70]	4.15[4,73,74]	4.15[2,61]	4.15[4,32,82]		4.15[4,40,57]		4.15[70]					4.35[12] 4.30[84]
Alloy, hot-rolled	3.95[1,17]	3.95[1,4,23]	3.95[1,6,8]		3.95[4]		3.95[1,6,25]	3.95[3]	3.95[3,4]		3.95[3]			4.25[12] 4.10[31]
Alloy, cold-drawn	4.90[2,17,52,69,71]	4.90[2,23,69,70]	4.90[4,73,74]	4.90[2,61]	4.90[4,42,82]		4.90[9,25,57]	4.90[3]	4.90[3,70]					5.05[84]
Hi str. low alloy, h.r.	5.20[1,5]		5.20[1,6,8]	5.20[4]			5.20[1,6]	5.20[3]	5.20[3]		5.20[3]			5.40[12]
PLATE Carbon steel	3.50[1,5]	3.50[1]	3.50[1,6,8]	3.50[4]			3.50[1] 3.75[13]		3.50[3]	3.75[26]	3.50[3]	3.50[3]	4.20[22]	3.75[12]
Floor plates	4.55[1]	4.55	4.55[3]	4.55[5]						4.55[26]				
Alloy	4.40[1]	4.40[1]	4.40[1]				4.75[13]			4.55[26]	4.40	4.40[3]		
Hi Str. low alloy	5.35[1,5]	5.35[1]	5.35[1,3]	5.35[4,5]			5.35[6] 5.70[13]			5.35[26]	5.35[3]	5.35[3]		5.80[12]
SHAPES, Structural	3.40[1,5,9]	3.40[1,23]	3.40[1,6,8]					3.45[3]	3.45[3]		3.45[3]			
Hi str. low alloy	5.15[1,5]	5.15[1]	5.15[1,6,8]				5.15[6]	5.20[3]	5.20[3]		5.20[3]			
MANUFACTURERS' WIRE Bright	4.50[2,5,18]	4.50[2,4,12,33,34]		4.50[2,77]			4.50[6]	Kokomo=4.60[10]			4.50[3]	4.60[3]	Duluth=4.50[2] Pueblo=4.75[14]	
PILING, Steel Sheet	4.20[1,9]	4.20[1]							4.20[3]					

Smaller numbers indicate producing companies. See key at right. Prices are in cents per lb unless otherwise noted. Extras apply.

IRON AGE

STEEL PRICES

Kansas City	Houston	Birmingham	WEST COAST Seattle, San Francisco, Los Angeles, Fontana		
			F=$76.00		INGOTS Carbon forging, net ton
	$59.00[83]		F=$77.00		Alloy, net ton
		$63.00[11]	F=$72.00[19]		BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton
	$71.00[83]	$63.00[11]	F=$82.00[19]	Geneva=$63.00[16]	Carbon forging billets, net ton
	$74.00[83]		F=$85.00[19]		Alloy net ton
					PIPE SKELP
	4.25[83]	3.85[11]	SF=4.50[24] LA=4.65[24,62]	Portsmouth=3.85[20] Worcester=4.15[2]	WIRE RODS
		3.35[4,11]	SF, LA=4.05[24] F=4.25[19]	Ashland=3.35[7] Niles=3.50[84], Geneva=3.45[16]	SHEETS Hot-rolled (18 ga. & hvr.)
		4.10[11]	SF=5.05[24] F=5.00[19]		Cold-rolled
		4.40[4,11]	SF, LA=5.15[24]	Ashland=4.40[7] Kokomo=4.50[30]	Galvanized (10 gage)
					Enameling (12 gage)
					Long ternes (10 gage)
		5.05[11]	F=6.74[19]		Hi str. low alloy, h.r.
			F=7.05[19]		Hi str. low alloy, c.r.
					Hi str. low alloy, galv.
3.85[83]	3.65[83]	3.25[11]	SF, LA=4.00[24,62] F=4.40[19], S=4.25[62]	Ashland=3.25[7] Atlanta=3.40[65]	STRIP Hot-rolled
			F=5.75[19] LA=5.85[27]	New Haven=4.65[2], 5.00[68] Trenton=5.00[45]	Cold-rolled
		4.95[11]	F=8.64[19]		Hi str. low alloy, h.r.
			F=8.95[19]		Hi str. low alloy, c.r.
		7.60[11]	SF=8.25[24]		TINPLATE Cokes, 1.50-lb base box 1.25 lb, deduct 20¢
Deduct $1.15, 90¢ and 85¢ respectively from 1.50-lb coke base box price					Electrolytic 0.25, 0.50, 0.75 lb box
					BLACKPLATE, 29 gage Hollowware enameling
4.05[83]	3.85[83]	3.45[4,11]	SF, LA=4.15[24] LA=4.15[62]	Atlanta=3.60[65]	BARS Carbon steel
4.05[83]	3.85[83]	3.45[4,11]	SF, S=4.20[62] F=4.10[19]	Atlanta=3.60[65]	Reinforcing‡
				Putnam, Newark=4.55[69]	Cold-finished
4.55[83]	4.35[83]		LA=5.00[62] F=4.95[19]		Alloy, hot-rolled
				Newark,[69] Worcester[2]=5.20 Hartford=5.20[4]	Alloy-, cold-drawn
		5.20[11]	F=6.25[19]		Hi str. low alloy, h.r.
	3.90[83]	3.50[4,11]	F=4.10[19] S=4.40[62] Geneva=3.50[16]	Claymont=3.90[29] Coatesville=3.90[21] Harrisburg=4.25[35]	PLATE Carbon steel
				Harrisburg=5.25[35]	Floor plates
			F=5.40[19]	Coatesville=4.80[21]	Alloy
		5.35[11]	F=5.95[19]	Geneva=5.35[16]	Hi str. low alloy
4.00[83]	3.80[83]	3.40[11]	SF=3.95[62] LA=4.00[24,62]	Phoenixville=4.25[56] Geneva=3.40[16]	SHAPES, Structural
		5.15[11]	F=4.00[19] S=4.05[62]	Fontana=5.75[19] Geneva=5.15[16]	Hi str. low alloy
5.10[83]	4.90[83]	4.50[4,11]	SF, LA=5.45[24,62]	Portsmouth=4.50[20] Worcester=4.80[2]	MANUFACTURERS' WIRE Bright

Notes: †Special coated mfg ternes deduct $1.15 from 1.50-lb coke base box price. Can-making quality blackplate, 55 to 128-lb, deduct $1.90 from 1.50-lb coke base box. ‡Straight lengths only from producer to fabricator.

KEY TO STEEL PRODUCERS

With Principal Offices

1 Carnegie-Illinois Steel Corp., Pittsburgh
2 American Steel & Wire Co., Cleveland
3 Bethlehem Steel Co., Bethlehem
4 Republic Steel Corp., Cleveland
5 Jones & Laughlin Steel Corp., Pittsburgh
6 Youngstown Sheet & Tube Co., Youngstown
7 Armco Steel Corp., Middletown, Ohio
8 Inland Steel Co., Chicago
9 Weirton Steel Co., Weirton, W. Va.
10 National Tube Co., Pittsburgh
11 Tennessee Coal, Iron & R. R. Co., Birmingham
12 Great Lakes Steel Corp., Detroit
13 Sharon Steel Corp., Sharon, Pa.
14 Colorado Fuel & Iron Corp., Denver
15 Wheeling Steel Corp., Wheeling, W. Va.
16 Geneva Steel Co., Salt Lake City
17 Crucible Steel Co. of America, New York
18 Pittsburgh Steel Co., Pittsburgh
19 Kaiser Steel Corp., Oakland, Calif.
20 Portsmouth Div., Detroit Steel Corp., Detroit
21 Lukens Steel Co., Coatesville, Pa.
22 Granite City Steel Co., Granite City, Ill.
23 Wisconsin Steel Co., South Chicago, Ill.
24 Columbia Steel Co., San Francisco
25 Copperweld Steel Co., Glassport, Pa.
26 Alan Wood Steel Co., Conshohocken, Pa.
27 Calif. Cold Rolled Steel Corp., Los Angeles
28 Allegheny Ludlum Steel Corp., Pittsburgh
29 Worth Steel Co., Claymont, Del.
30 Continental Steel Corp., Kokomo, Ind.
31 Rotary Electric Steel Co., Detroit
32 Laclede Steel Co., St. Louis
33 Northwestern Steel & Wire Co., Sterling, Ill.
34 Keystone Steel & Wire Co., Peoria, Ill.
35 Central Iron & Steel Co., Harrisburg, Pa.
36 Carpenter Steel Co., Reading, Pa.
37 Eastern Stainless Steel Corp., Baltimore
38 Washington Steel Corp., Washington, Pa.
39 Jessop Steel Co., Washington, Pa.
40 Blair Strip Steel Co., New Castle, Pa.
41 Superior Steel Corp., Carnegie, Pa.
42 Timken Steel & Tube Div., Canton, Ohio
43 Babcock & Wilcox Tube Co., Beaver Falls, Pa.
44 Reeves Steel & Mfg. Co., Dover, Ohio
45 John A. Roebling's Sons Co., Trenton, N. J.
46 Simonds Saw & Steel Co., Fitchburg, Mass.
47 McLouth Steel Corp., Detroit
48 Cold Metal Products Co., Youngstown
49 Thomas Steel Co., Warren, Ohio
50 Wilson Steel & Wire Co., Chicago
51 Sweet's Steel Co., Williamsport, Pa.
52 Superior Drawn Steel Co., Monaca, Pa.
53 Tremont Nail Co., Wareham, Mass.
54 Firth Sterling Steel & Carbide Corp., McKeesport, Pa.
55 Ingersoll Steel Div., Chicago
56 Phoenix Iron & Steel Co., Phoenixville, Pa.
57 Fitzsimmons Steel Co., Youngstown
58 Stanley Works, New Britain, Conn.
59 Universal-Cyclops Steel Corp., Bridgeville, Pa.
60 American Cladmetals Co., Carnegie, Pa.
61 Cuyahoga Steel & Wire Co., Cleveland
62 Bethlehem Pacific Coast Steel Corp., San Francisco
63 Follansbee Steel Corp., Pittsburgh
64 Niles Rolling Mill Co., Niles, Ohio
65 Atlantic Steel Co., Atlanta
66 Acme Steel Co., Chicago
67 Joslyn Mfg. & Supply Co., Chicago
68 Detroit Steel Corp., Detroit
69 Wyckoff Steel Co., Pittsburgh
70 Bliss & Laughlin, Inc., Harvey, Ill.
71 Columbia Steel & Shafting Co., Pittsburgh
72 Cumberland Steel Co., Cumberland, Md.
73 La Salle Steel Co., Chicago
74 Monarch Steel Co., Inc., Hammond, Ind.
75 Empire Steel Co., Mansfield, Ohio
76 Mahoning Valley Steel Co., Niles, Ohio
77 Oliver Iron & Steel Co., Pittsburgh
78 Pittsburgh Screw & Bolt Co., Pittsburgh
79 Standard Forging Corp., Chicago
80 Driver Harris Co., Harrison, N. J.
81 Detroit Tube & Steel Div., Detroit
82 Reliance Div., Eaton Mfg. Co., Massillon, Ohio
83 Sheffield Steel Corp., Kansas City
84 Plymouth Steel Co., Detroit

STAINLESS STEELS

Base prices, in cents per pound, f.o.b. producing point

Product	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling	13.75	14.50	16.00	15.50	23.75	19.25	21.00	12.25	14.25	12.50
Slabs, billets, rerolling	18.00	19.25	21.25	20.25	31.25	25.50	27.75	16.60	19.50	16.25
Forg. discs, die blocks, rings	32.00	32.00	34.50	33.50	50.50	38.00	42.50	26.00	26.50	26.50
Billets, forging	25.75	25.75	27.75	27.00	40.50	30.50	34.25	21.00	21.50	21.50
Bars, wire, structurals	30.00	30.00	32.50	31.50	47.50	35.50	40.00	24.50	25.00	25.00
Plates	32.00	32.00	34.00	34.00	50.50	39.50	44.00	26.00	26.50–27.00	26.50
Sheets	39.00	39.00	41.00	41.00	54.50	47.00	51.50	34.50	35.00	37.00
Strip, hot-rolled	25.50	27.00	31.25	29.00	47.25	35.75	40.00	22.50	29.25	23.0.
Strip, cold-rolled	32.00	34.50	38.00	36.50	56.50	46.00	50.00	28.50	35.00	29.00

STAINLESS STEEL PRODUCING POINTS—*Sheets:* Midland, Pa., 17; Brackenridge, Pa., 28; Butler, Pa., 7; McKeesport, Pa., 1; Washington, Pa., 38, 39; Baltimore, 37; Middletown, Ohio, 7; Massillon, Ohio, 4; Gary, 1; Bridgeville, Pa., 59; New Castle, Ind., 55; Ft. Wayne, nd., 67; Lockport, N. Y., 46.

Strip: Midland, Pa., 17; Cleveland, 2; Carnegie, Pa., 41; McKeesport, Pa., 54; Reading, Pa., 36; Washington, Pa., 38; W. Leechburg, Pa., 28; Bridgeville, Pa., 59; Detroit, 47; Massillon, Canton, Ohio, 4; Middletown, Ohio, 7; Harrison, N. J., 80; Youngstown, 48; Lockport, N. Y., 46; New Britain, Conn., 58; Sharon, 13; Butler, Pa., 7.

Bars: Baltimore, 7; Duquesne, Pa., 1; Munhall, Pa., 1; Reading, Pa., 36; Titusville, Pa., 59; Washington, Pa., 39; McKeesport, Pa., 1, 54; Bridgeville, Pa., 59; Dunkirk, N. Y., 28; Massillon, Ohio, 4; Chicago, 1; Syracuse N. Y., 17; Watervliet, N. Y., 28; Waukegan, Ill., 2; Lockport, N. Y., 46; Canton, Ohio, 42; Ft. Wayne, Ind., 67.

Wire: Waukegan, Ill., 2; Massillon, Ohio, 4; McKeesport, Pa., 54; Bridgeport, Conn., 44; Ft. Wayne, Ind., 67; Trenton, N. J., 45; Harrison, N. J., 80; Baltimore, 7; Dunkirk, 28.

Structurals: Baltimore, 7; Massillon, Ohio, 4; Chicago, 1, 67; Watervliet, N. Y., 28; Bridgeport, Conn., 44.

Plates: Brackenridge, Pa., 28; Butler, Pa., 7; Chicago, 1; Munhall, Pa., 1; Midland, Pa., 17; New Castle, Ind., 55; Lockport, N. Y., 46; Middletown, 7; Washington, Pa., 39; Cleveland, Massillon, 4.

Forged discs, die blocks, rings: Pittsburgh, 1, 17; Syracuse, 17; Ferndale, Mich., 28.

Forging billets: Midland, Pa., 17; Baltimore, 7; Washington, Pa., 39; McKeesport, 54; Massillon, Canton, Ohio, 4; Watervliet, 28; Pittsburgh, Chicago, 1.

ELECTRICAL SHEETS

22 gage, HR cut lengths, f.o.b. mill

	Cents per lb.
Armature	*6.20
Electrical	*6.70
Motor	*7.95
Dynamo	8.75
Transformer 72	9.30
Transformer 65	9.85
Transformer 58	10.55
Transformer 52	11.35

PRODUCING POINTS—Beech Bottom, W. Va., 15; Brackenridge, Pa., 28; Follansbee, W. Va., 63; Granite City, Ill., 22*; add 70¢; Indiana Harbor, Ind., 8; Mansfield, Ohio, 75; Niles, Ohio, 64, 76; Vandergrift, Pa., 1; Warren, Ohio, 4; Zanesville, Ohio, 7.

MERCHANT WIRE PRODUCTS

	Base Column Pittsburg,	
To dealers, f.o.b. mill		*Calif.*
Standard & coated nails*	106	125§
Woven wire fence†	116	139
Fence posts, carloads††	116	...
Single loop bale ties	113	137
Galvanized barbed wire**	126	146
Twisted barbless wire	126	146

* Pgt., Chi., Duluth; Worchester, 6 columns higher; Houston, 8 columns higher; Kansas City, 12 columns higher †15½ gage and heavier. **On 80 rod spools, in carloads. ††Duluth, Joliet; Johnstown, 112.

	Base per 100 lb	*Pittsburg, Calif.*
Merch. wire annealed‡	$5.35	$6.30
Merch. wire galv.‡	5.60	6.55
Cut nails, carloads‡‡	6.75	...

‡Add 30¢ at Worcester; 20¢ at Chicago; 10¢ at Sparrows Pt.
‡‡ Less 20¢ to jobbers.
§ Torrance 126.

PRODUCING POINTS — *Standard, Coated or galvanized nails, woven wire fence, bale ties, and barbed wire:* Alabama City, Ala., 4; Atlanta, 65; Aliquippa, Pa., (except bale ties), 5; Bartonville, Ill. (except bale ties), 34; Chicago, 4; Donora, Pa., 2; Duluth, 2; Fairfield, Ala., 11; Johnstown, Pa. (except bale ties), 3; Joliet, Ill., 2; Kokomo, Ind., 30; Minnequa, Colo., 14; Monessen, Pa. (except bale ties), 18; Pittsburg, Calif., 24; Portsmouth, Ohio, 20; Rankin, Pa., (except bale ties), 2; Sparrows Point (except woven fence), 3; Sterling, Ill., 33; San Francisco (except nails and woven fence), 14; Torrance, Calif. (nails only), 24; Worcester (nails only), 2; Houston (except bale ties), 83; Kansas City, 83.

Fence Posts: Duluth, 2; Johnstown, Pa., 3; Joliet, Ill., 2; Minnequa, Colo., 14; Moline, Ill., 4; Williamsport, Pa., 51.

Cut nails: Wheeling, W. Va., 15; Conshohocken, Pa., 26; Warehame, Mass., 53.

RAILS, TRACK SUPPLIES

F.o.b. mill

Standard rails, 100 lb and heavier, No. 1 quality, per 100 lb	$3.40
Joint bars, per 100 lb	4.40
Light rails, per 100 lb	3.75

	Base Price cents per lb
Track spikes†	5.60
Axles	5.25
Screw spikes	8.60
Tie plates	4.20
Pittsburg, Torr., Calif.; Seattle	4.35
Track bolts, untreated	8.85
Track bolts, heat treated, to railroads	9.10

†Kansas City, 5.85¢.

PRODUCING POINTS—*Standard rails:* Bessemer, Pa., 1; Ensley, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Minnequa, Colo., 14; Steelton, 3.

Light rails: All the above except Indiana Harbor and Steelton, plus Fairfield, Ala., 11; Johnstown, 3; Minnequa, 14.

Joint bars: Bessemer, Pa., 1; Fairfield, Ala., 11; Indiana Harbor, Ind., 8; Joliet, Ill., 1; Lackawanna, N. Y., 3; Steelton, Pa., 3; Minnequa, Colo., 14.

Track spikes: Indiana Harbor, Ind., 6, 8; Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 5; Chicago, 4; Struthers, 6; Youngstown, 4.

Track bolts: Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 77, 78.

Axles: Indiana Harbor, Ind., 79; Johnstown, Pa., 3.

Tie plates: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Pittsburg, Calif., 24; Seattle, 62; Steelton, Pa., 3; Torrance, Calif., 24; Minneona, Colo., 14.

Numbers after producing points correspond to steel producers. See key on Steel Price page.

PIPE AND TUBING

Base discounts, f.o.b. mills
Base price about $200.00 per net ton

Standard, T & C

Steel, Buttweld*

	Black	*Galv*
⅛-in.	40½ to 38½	21 to 19
¼-in.	43½ to 41½	25 to 23
1-in.	46 to 44	28 to 26
1¼-in.	46½ to 44½	28½ to 26½
1½-in.	47 to 45	29 to 27
2-in.	47½ to 45½	29½ to 27½
2½ to 3-in.	48 to 46	30 to 28

Steel, Lapweld

2-in.	38	19½
2½ to 3-in.	42	23½
3½ to 6-in.	43 to 40	24½ to 21½

Steel, seamless

2-in.	36	17½
2½ to 3-in.	39	20½
3½ to 6-in.	41	22½

Wrought iron, buttweld

⅛-in.	+26½	+56
¾-in.	+16½	+45
1 & 1¼-in.	+10½	+36
1½-in.	+ 4½	+32½
2-in.	+ 4	+32

Wrought iron, lapweld

2-in.	+13½	+40
2½ to 3½-in.	+11	+35½
4-in.	+ 6	+29½
4½ to 8-in.	+ 8	+31
9 to 12-in.	+18	+40½

Extra Strong, Plain Ends

Steel, buttweld

⅛-in.	39½ to 37½	21½ to 19½
¼-in.	43½ to 41½	25½ to 23½
1-in.	45½ to 43½	28½ to 26½
1¼-in.	46 to 44	29 to 27
1½-in.	46½ to 44½	29½ to 27½
2-in.	47 to 45	30 to 29
2½ to 3-in.	47½ to 45½	30½ to 28½

Steel, lapweld

2-in.	37	19½
2½ to 3-in.	42	24½
3½ to 6-in.	44½ to 41½	27 to 24

Steel, seamless

2-in.	35	17½
2½ to 3-in.	38	21½
3½ to 6-in.	42½	25

Wrought iron, buttweld

⅛-in.	+22	+50
¾-in.	+15½	+43
1 to 2-in.	+ 5½	+32

Wrought iron, lapweld

2-in.	+10½	+36½
2½ to 4-in.	+ 1	+25
4½ to 6-in.	+ 5	+29½
7 & 8-in.	list	+24½
9 to 12-in.	+11½	+32½

For threads only, buttweld, lapweld and seamless pipe, one point higher discount (lower price) applies. For plain ends, buttweld, lapweld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lapweld and seamless 3½-in. and larger four points higher discount (lower price) applies. On buttweld, lapweld steel pipe, jobbers are granted a discount of 5 pct.
* Fontana, Calif., deduct 11 points from figures in left columns.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Prices per 100 ft at mill in carload lots, cut lengths 10 to 24 ft inclusive.

OD in.	gage BWG	Seamless H.R.	Seamless C.R.	Electric H.R.	Weld C.D.
2	13	$20.61	$24.24	$19.99	23.51
2½	12	27.71	32.58	26.88	31.60
3	12	30.82	36.27	29.90	35.18
3½	11	38.52	45.38	37.36	43.99
4	10	47.82	56.25	46.39	54.56

WAREHOUSE PRICES

Base prices, f.o.b. warehouse, dollars per 100 lb. (Metropolitan area delivery, add 20¢ to base price except Birmingham, San Francisco, Cincinnati, New Orleans, St. Paul (*), add 15¢; Philadelphia, add 25¢, Chicago, add 30¢).

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (16 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140 Ann
Baltimore	5.15	6.39[1]	6.55[2] 6.65	5.59-5.59[11]	....	5.40-6.04[11]	5.69	5.59	6.19	9.69	9.99	11.12	11.49
Birmingham*	5.15[10]	5.95	6.15[7]	5.10	....	5.40	5.25	5.10	6.88	....	....	....	...
Boston	5.75	6.55[20]	6.94[2] 7.14	5.70	6.90-6.95	6.08	5.75	5.60	6.19-6.69	9.70-9.97	9.58-10.00	11.15	11.45
Buffalo	5.15	5.95	6.94	5.41	7.27	5.65	5.35	5.15	5.75	9.60	9.90	11.05	11.35
Chicago*	5.15	6.20	6.95	5.10	6.30	5.40	5.25	5.10	5.65	9.25	9.55	10.70	11.00
Cincinnati*	5.42-5.97	5.99-6.24	6.39	5.35	....	5.79	5.64	5.35-5.54	5.96-6.25	9.60-9.81	9.90-10.11	11.05-11.26	11.35-11.56
Cleveland	5.15	5.95	7.00-7.10	5.24	6.35	5.52	5.37	5.12	5.75	9.38	9.68	10.81	11.11
Detroit	5.33	6.08-6.33	7.09	5.49	6.43-6.80	5.58-5.79	5.64-5.68	5.39	5.91	9.56	9.86	11.01	11.31
Houston	6.00	....	....	6.10	....	6.00	5.95	6.10	7.80	10.35-10.45	10.80-10.80	11.50	11.96-12.10
Indianapolis	....	....	....	....	7.38	....	....	....	6.15	....	....	....	....
Kansas City	5.75	6.55[20]	7.55	5.70	6.95	6.00	5.85	5.70	6.35	9.85	10.15	11.30	11.60
Los Angeles	5.90	7.45	7.70[2]	5.95	8.70[16]	6.00	5.90	5.90	7.55	10.75	10.75	12.45	12.75
Memphis	5.93	6.68	....	5.98	6.80-6.51	6.08	5.93	5.68	6.51	....	....	....	....
Milwaukee	5.29	6.09	6.84-6.99	5.24	6.32	5.54	5.39	5.24	5.89	9.39	9.69	10.84	11.14
New Orleans*	5.50[1]	6.75-6.85[1]	....	5.55[1]	6.80-6.90[1]	5.66	5.55[1]	5.55[1]	6.75-6.80	....	....	....	....
New York	5.32	6.64	7.54[2]	5.94	6.78	5.88	5.65	5.67	6.44	9.60	9.90	11.05	11.35
Norfolk	6.10[13]	7.00	....	6.30[13]	....	6.15[13]	6.20[13]	6.15[13]	7.20[13]	....	....	....	....
Philadelphia*	6.05	6.20-6.35	6.85[2] 7.25	5.65	6.29	5.65	5.45	5.60	6.21	9.35	9.65	10.80	11.10
Pittsburgh	5.15	5.95	6.60	5.20	5.95-6.00	5.35	5.25	5.10	5.75	9.25	9.55	10.70	11.00
Portland	6.60-7.10[1]	8.40[2]	....	6.85[9]	....	6.40[9]	6.50	6.45-6.45[9]	8.60[14]	12.00[18]	11.60[18]	....	....
Salt Lake City	5.85	6.70	....	7.45	8.75	6.10[3]	5.90	7.35[4]	8.75	....	....	....	....
San Francisco*	6.20	7.60[2]	7.75[2]	6.15	7.85[16]	6.10	6.00	6.00	7.55	10.75	10.75	12.45	12.75
Seattle	6.60[4]	8.15[2]	8.40[2]	6.85[4]	....	6.35[4]	6.20[4]	6.35[4]	8.50[14]	....	11.60[18]	....	13.60[18]
St. Louis	5.48	6.28	7.18	5.43	7.30	5.73	5.58	5.43	6.08	9.58	9.88	11.03	11.33
St. Paul*	5.71	6.51	7.41	5.66	6.16-6.62	5.96	5.81	5.66	6.31	9.81	10.11	11.26	11.56

BASE QUANTITIES *(Standard unless otherwise keyed on prices.)*
Hot-rolled sheets and strip, hot rolled bars and bar shapes, structural shapes, plate, galvanized sheets and cold-rolled sheets; 2000 to 9999 lb. Cold-finished bars; 2000 lb or over. Alloy bars: 1000 to 1999 lb.

All HR products may be combined to determine quantity bracket. All galvanized sheets may be combined to determine quantity bracket. CR sheets may not be combined with each other or with galv. sheets to determine quantity bracket.

Exceptions:
(1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 to 5999 lb; (6) 1000 lb and over; (7) 500 to 1499 lb; (8) 400 lb and over; (9) 400 to 9999 lb; (10) 500 to 9999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 9999 lb; (16) 6000 lb and over; (17) up to 1999 lb; (18) 1000 to 4999 lb; (19) 1500 to 3499 lb; (20) CR sheets may be combined for quantity; (21) 3 to 24 bundles.

PIG IRON PRICES

Dollars per gross ton. Delivered prices do not include 3 pct tax on freight.

PRODUCING POINT PRICES

Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	48.00	48.50	49.00	49.50	.....
Birmingham	45.38	45.88	.....	.....	.....
Buffalo	49.00	49.50	50.00	.....	.....
Chicago	49.00	49.50	49.50	50.00	.....
Cleveland	49.00	49.50	49.50	50.00	54.00
Daingerfield, Tex.	45.00	45.50	45.50	.....	.....
Duluth	49.00	49.50	49.50	50.00	.....
Erie	49.00	49.50	49.50	50.00	.....
Everett		52.25	52.75	.....	.....
Fontana	52.00	52.50	.....	.....	.....
Granite City	50.90	51.40	51.90	.....	.....
Ironton, Utah	46.00	46.50	.....	.....	.....
Pittsburgh	48.00*	.....	.....	47.00	.....
Neville Island	49.00	49.50	49.50	50.00	.....
Geneva, Utah	46.00	46.50	.....	.....	.....
Sharpsville	49.00	49.50	49.50	50.00	.....
Steelton	48.00	48.50	49.00	49.50	54.00
Swedeland	50.00	50.50	51.00	51.50	.....
Toledo	49.00	49.50	49.50	50.00	.....
Troy, N. Y.	51.00	51.50	52.00	.....	54.00
Youngstown	49.00	49.50	49.50	50.00	.....

DELIVERED PRICES (BASE GRADES)

Consuming Point	Producing Point	Rail Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston	Everett	$.60-.80	.....	52.85-53.05	53.55-53.75	.....	.....
Boston	Steelton	6.90	.....	.....	.....	.....	60.90
Brooklyn	Bethlehem	4.29	.....	52.79	53.29	53.79	.....
Cincinnati	Birmingham	6.70	52.08	52.58	.....	.....	.....
Jersey City	Bethlehem	2.63	.....	51.13	51.63	52.13	.....
Los Angeles	Geneva-Ironton-Fontana	7.70	53.70	54.20	.....	.....	.....
Mansfield	Cleveland-Toledo	3.33	49.33	49.83	49.83	50.33	54.33
Philadelphia	Bethlehem	2.39	50.39	50.89	51.39	51.89	.....
Philadelphia	Swedeland	1.44	51.44	51.94	52.44	52.94	.....
Philadelphia	Steelton	3.09	51.09	51.59	52.09	52.59	57.09
Rochester	Buffalo	2.63	51.63	52.13	52.63	.....	.....
San Francisco	Geneva-Ironton-Fontana	7.70	53.70	54.20	.....	.....	.....
Seattle	Geneva-Ironton-Fontana	7.70	53.70	54.20	.....	.....	.....
St. Louis	Granite City	0.75 Arb.	48.65	49.15	49.65	.....	.....
Syracuse	Buffalo	3.58	52.58	53.08	53.58	.....	.....

* *Monessen, $51.00.*

Producing point prices are subject to switching charges; silicon differential (not to exceed 50c per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct for foundry iron); phosphorus differentials, a reduction of 38c per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50c per ton for each 0.50 pct manganese content in excess of 1.00 pct. $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.01 to 6.50 pct C/L per g.t., f.o.b. Jackson, Ohio—$57.00; f.o.b. Buffalo, $58.25. Add $1.00 per ton for each additional 0.50 pct Si up to 17 pct. Add 50c per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are $1.00 per ton above silvery iron prices of comparable analysis. *****Buffalo, add $1.50.***

Charcoal pig iron base price for low phosphorus $62.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, $70.56. High phosphorus charcoal pig iron is not being produced.

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts, f.o.b. mill Pittsburgh, Cleveland, Birmingham or Chicago) Base discount

Machine and Carriage Bolts

	Pct Off List Less Case	C.
½ in. & smaller x 6 in. & shorter	27	38
9/16 & ⅝ in. x 6 in. & shorter	29	40
¾ in. & larger x 6 in. & shorter	26	37
All diam. longer than 6 in.	22	34
Lag, all diam, longer than 6 in.	28	39
Lag, all diam x 6 in. & shorter	30	41
Plow bolts	40	—

Nuts, Cold Punched or Hot Pressed

(Hexagons or Square)

½ in. and smaller	25	37
9/16 to ⅝ in.	23	35
¾ to 1½ in. inclusive	23	35
1⅝ in. and larger	16	29

Semifinished Hexagon Nuts

(Less case lots)

	Pct Off List Reg	Hvy	Lt
½ in. and smaller	41	35	41
9/16 to ⅝ in.	36	30	36
¾ to 1½ in.	31	27	33
1⅝ in. and larger	21	17	..

In full case lots, 15 pct additional discount.

Stove Bolts

	Pct Off List
Packaged, steel, plain finish	63
Packaged, plated finish	50
Bulk, plain finish**	69*

* Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

** Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Large Rivets

(½ in. and larger) Base per 100 lb

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham, Lebanon, Pa. $7.25

Small Rivets

(7/16 in. and smaller) Pct Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham 43

Cap and Set Screws

(In bulk) *Pct Off List*

Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright	60
¼ in. through ⅝ in. x 6 in. and shorter high C heat treated	54
Milled studs	23
Flat head cap screws, listed sizes	24
Fillister head cap, listed sizes	43
Set screws, sq head, cup point, 1 in. diam and smaller x 6 in. and shorter	59

C-R SPRING STEEL

Base per pound f.o.b. mill

0.26 to 0.40 carbon	4.50¢
0.41 to 0.60 carbon	5.95¢
0.61 to 0.80 carbon	6.55¢
0.81 to 1.05 carbon	8.50¢
1.06 to 1.35 carbon	10.80¢

Worcester, add 0.30¢; Sharon, add 0.35¢.

LAKE SUPERIOR ORES

(51.50% Fe; natural content, delivered lower lake ports)

	Per gross ton
Old range, bessemer	$8.10
Old range, nonbessemer	7.95
Mesabi, bessemer	7.85
Mesabi, nonbessemer	7.70
High phosphorus	7.70

After Jan. 25, 1950, increases or decreases in Upper Lake rail freight, dock handling charges and taxes are for buyers' account.

ELECTRODES

Cents per lb, f.o.b. plant, threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb
	GRAPHITE	
17, 18, 20	60, 72	17.00¢
8 to 16	48, 60, 72	17.00¢
7	48, 60	18.64¢
6	48, 60	19.95¢
4, 5	40	20.48¢
3	40	21.53¢
2½	24, 30	22.05¢
2	24, 30	24.15¢
	CARBON	
40	100, 110	7.65¢
35	65, 110	7.65¢
30	65, 84, 110	7.65¢
24	72 to 104	7.65¢
20	84, 90	7.65¢
17	60, 72	7.65¢
14	60, 72	8.16¢
10, 12	60	8.42¢
8	60	8.67¢

CLAD STEEL

Base prices, cents per pound, f.o.b. mill

	Plate	Sheet
Stainless-carbon		
No. 304, 20 pct, Coatesville, Pa. (21)	*28.00	
Washgtn, Pa. (39)	*28.00	
Claymont, Del. (29)	*26.50	
Conshohocken, Pa. (26)		*24.00
New Castle, Ind. (55)	*26.50	*25.50
Nickel-carbon 10 pct, Coatesville (21)	31.00	
Inconel-carbon 10 pct, Coatesville (21)	39.00	
Monel-carbon 10 pct, Coatesville (21)	32.00	
No. 302 Stainless-copper-stainless, Carnegie, Pa. (60)		75.00
Aluminized steel sheets, hot dip, Butler, Pa. (7)		7.75

* Includes annealing and pickling, or sandblasting.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	$1.00
18	4	1	—	5	$1.565
18	4	2	—	—	$1.13
1.5	4	1.5	8	—	71.5¢
6	4	2	6	—	76.5¢

High-carbon-chromium	57.5¢
Oil hardened manganese	32¢
Special carbon	29.5¢
Extra carbon	24.5¢
Regular carbon	21¢

Warehouse prices on and east of Mississippi are 3¢ per lb higher. West of Mississippi, 5¢ higher.

COKE

	Net Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa.	$14.00 to $14.50
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	$16.50 to $17.00
Foundry, oven coke	
Buffalo, del'd	$24.00
Chicago, f.o.b.	21.00
Detroit, f.o.b.	21.65
New England, del'd	23.40
Seaboard, N. J., f.o.b.	22.00
Philadelphia, f.o.b.	21.25
Swedeland, Pa., f.o.b.	21.20
Painesville, Ohio, f.o.b.	21.90
Erie, del'd	$21.04 to 21.25
Cleveland, del'd	22.62
Cincinnati, del'd	22.71
St. Paul, f.o.b.	21.00
St. Louis, del'd	22.18
Birmingham, del'd	20.79

FLUORSPAR

Washed gravel fluorspar, f.o.b. cars, Rosiclare, Ill. Base price, per ton net; Effective CaF, content:

70% or more	$39.00
60% or less	36.00

REFRACTORIES

Fire Clay Brick *(F.o.b. works) Carloads, Per 1000*

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5)	$86.00
No. 1 Ohio	80.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	80.00
No. 2 Ohio	72.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50)	14.00

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$86.00
Childs, Pa.	90.00
Hays, Pa.	91.00
Chicago District	95.00
Western Utah and Calif.	101.00
Super Duty, Hays, Pa., Athens, Tex., Chicago	106.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	15.00
Silica cement, net ton, bulk, Hays, Pa.	17.00
Silica cement, net ton, bulk, Ensley, Ala.	16.00
Silica cement, net ton, bulk, Chicago District	16.00
Silica cement, net ton, bulk, Utah and Calif.	22.50

Chrome Brick *Per Net Ton*

Standard chemically bonded, Balt., Chester $72.00

Magnesite Brick

Standard, Baltimore	$94.00
Chemically bonded, Baltimore	83.00

Grain Magnesite *St. ⅝-in. grains*

Domestic, f.o.b. Baltimore, in bulk fines removed	$56.00 to $57.00
Domestic, f.o.b. Chewelah, Wash., in bulk	33.00
in sacks	38.00

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢ $13.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f. New York, ocean bags	7.4¢ to 9.0¢
Canadian sponge iron, del'd, in East	10.00¢
Domestic sponge iron, 98+% Fe, carload lots	9.0¢ to 15.0¢
Electrolytic iron, annealed, 99.5+% Fe	36.0¢ to 39.5¢
Electrolytic iron unannealed, minus 325 mesh, 99+% Fe	48.5¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+% Fe	70.0¢ to $1.35
Aluminum	29.00¢
Brass, 10 ton lots	30.00¢ to 33.25¢
Copper, electrolytic	10.25¢ plus metal value
Copper, reduced	10.00¢ plus metal value
Cadmium 100-199 lb	95¢ plus metal value
Chromium, electrolytic, 99% min., and quantity	$3.50
Lead	6.5¢ plus metal value
Manganese	52.00¢
Molybdenum, 99%	$2.65
Nickel, unannealed	75.5¢
Nickel, annealed	81.5¢
Nickel, spherical, unannealed	78.5¢
Silicon	34.00¢
Solder powder	6.5¢ to 8.5¢ plus met. value
Stainless steel, 302	75.00¢
Tin	11.00¢ plus metal value
Tungsten, 99%	$3.40
Zinc, 10 ton lots	20.50¢ to 23.85¢

CAST IRON WATER PIPE

Per net ton

6 to 24-in., del'd Chicago	$95.30 to $98.80
6 to 24-in. del'd N. Y.	93.50 to 95.50
6 to 24-in., Birmingham	81.50 to 86.00
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less	$108.50 to $113.00

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

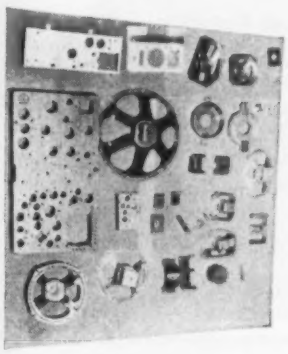
Prices Continued on Page 140

RCA speeds production, cuts cleaning costs on a wide range of metal parts . . . with

Courtesy: Radio Corporation of America, Camden, N. J.

VAPOR DEGREASING

From fabricated steel racks . . . to aluminum microphone castings . . . all kinds of parts made of all types of metals are cleaned quickly and economically by vapor degreasing in the Camden plant of the Radio Corporation of America.



In 1940, RCA replaced the hand cleaning of its electronic equipment parts with this speedy modern method. The trichlorethylene solvent, supplied by equipment manufacturers under various trade marks, has proved highly efficient in the removal of oil, dirt, and grease from even the most intricate parts. The work is degreased before and after machining and finishing . . . is delivered clean and dry, ready for inspection or further processing. As a result, RCA has been able to speed up production, yet hold down its cleaning costs.

The increased production and reduced operating time realized at RCA may indicate the possibility of more efficient cleaning with vapor degreasing in your plant. An investigation of this rapid, thorough and economical method will prove to you why it is being used by thousands of plants to clean work ranging from watch springs to machine housings.

USE DU PONT TRICHLORETHYLENE DEGREASING SOLVENT

Thousands of manufacturers are using Du Pont Trichlorethylene for vapor degreasing.

Under various trade marks, Du Pont degreasing solvents have been widely used for many years. These solvents are stable . . . the best yet developed by Du Pont for metal degreasing. They stand up against contaminating and destructive materials which may be introduced in degreasing . . . assist materially in carrying out efficient cleaning.

Tune in Du Pont "Cavalcade of America" Tuesday nights—NBC coast to coast

non-
DU PONT *flammable* SOLVENTS for VAPOR DEGREASING

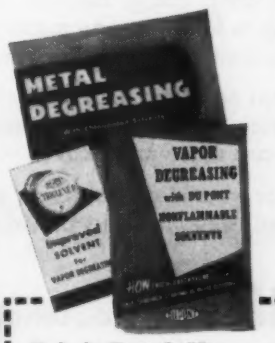
SOLD NATIONALLY THROUGH DISTRIBUTORS

DU PONT

REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

SEND FOR HELPFUL FREE LITERATURE



These three booklets will give you detailed information on the advantages of vapor degreasing, the equipment, industrial applications, and the Du Pont degreasing solvents.

Mail the coupon today!

E. I. du Pont de Nemours & Co. (Inc.)
Electrochemicals Dept., Wilmington 98, Del.

Please send me your free literature covering the vapor degreasing process and solvents. We are interested in cleaning _____ products.

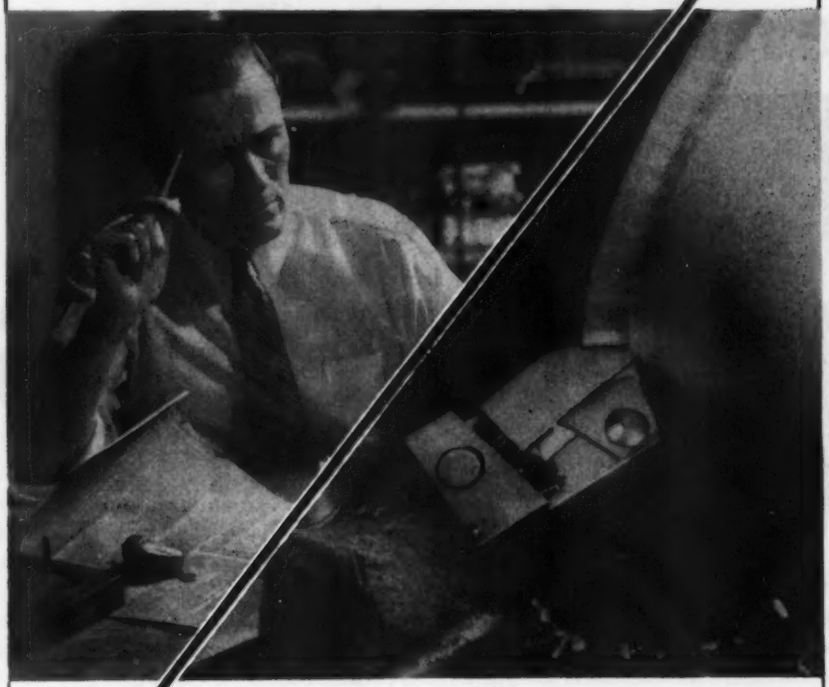
*Name*_____ *Position*_____

*Firm*_____

*Street & No.*_____

*City*_____ *State*_____

When the Going Gets TOUGH



Keep Going with Kennametal

• Are tough jobs slowing you down—hogging cuts from rough forgings . . . cleaning up sandy castings . . . multiple finishing of complex parts . . . precision machining that defies your efforts to hold close tolerances? Are you losing time on tight production schedules, having to replace worn tools frequently?

Use Kennametal—and keep going. Records show that Kennametal has machined up to four times as many pieces per unit of carbide consumed—on similar work under similar conditions.

That means Kennametal costs the user only about one-fourth as much in terms of service delivered. Furthermore—machines keep going—man-hours are more productive.

If the going is tough for you—let one of our engineers demonstrate how Kennametal smoothes out production problems.

KENNAMETAL *Inc.*, Latrobe, Pa.

MANUFACTURERS OF SUPERIOR CEMENTED CARBIDES AND CUTTING TOOLS THAT INCREASE PRODUCTIVITY

Visit our Exhibit, SPACE 808, National Metal Exposition, Chicago, Oct. 23-27.

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered. (65-72% Cr, 2% max. Si.)

0.06% C	28.75	0.20% C	27.75
0.10% C	28.25	0.50% C	27.50
0.15% C	28.00	1.00% C	27.25
2.00% C			27.00
65-69% Cr, 4-9% C			20.50
62-66% Cr, 4-6% C, 6-9% Si.			21.75

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	21.60
Ton lots	23.75
Less ton lots	25.25

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

Chromium Metal

Contract prices, per lb chromium contained packed, delivered, ton lots. 97% min. Cr, 1% max. Fe.

0.20% Max. C.	$1.09
0.50% max. C.	1.05
.00 min. C	1.04

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 20.50¢ per lb of contained Cr plus 11.30¢ per lb of contained Si.

Bulk 1-in. x down, 20.65¢ per lb contained Cr plus 11.50¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, dump, delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe.

Carloads	17.90
Ton lots	21.00
Less ton lots	22.50

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	19.25
Ton lots	21.55
Less ton lots	22.55

CMSZ

Contract price, cents per pound of alloy, delivered.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50.56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

Ton lots	19.75
Less ton lots	21.00

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	15.75¢
Less ton lots	17.00¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	17.00¢
Ton lots to carload packed	18.00¢
Less ton lots	19.50¢

SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

Ton lots	17.25
Less ton lots	18.50

Prices Continued on Page 142

You benefit from this dramatic new campaign in the

Can you find the clue...
...to quality? ✕ marks the spot...
PHILLIPS SCREW
There's no mystery to quality when you know what clue to look for. Phillips Cross-Recessed-Head Screws are proof of extra care in today's manufacture. They assure lasting, creep-free tightness at all points of fastening. Be on the lookout for Phillips Screws . . . used on everything from streamlined cars to modern hearing aids.
PHILLIPS Cross-Recessed-Head SCREWS
on sale at hardware, automotive and mill supply outlets

THE SATURDAY EVENING **POST**

Public urged to look for Phillips Screws —the clue to quality . . . found on all modern products

BEGINNING AUGUST 26, a striking campaign on Phillips Screws was launched in The Saturday Evening Post. Aimed at the general public, it tells 14 million readers to look for the mark of extra quality in well-built products . . . *the identifying X that appears on the head of Phillips Cross-Recessed-Head Screws.*

Whether you use Phillips wood screws, machine screws or tapping screws, you benefit from this forceful quality story. Remember, too, when you use Phillips Screws you build a better product . . . save time, money, work-hours.

Be sure to put the "clue" to extra quality in your product.

PHILLIPS *Cross-Recessed-Head* SCREWS

✕ *marks the spot . . . the mark of extra quality*

AMERICAN SCREW CO. • THE BLAKE & JOHNSON CO. • CAMCAR SCREW & MFG. CORP.
CENTRAL SCREW CO. • CONTINENTAL SCREW CO. • ELCO TOOL & SCREW CORP.
GREAT LAKES SCREW CORP. • THE H. M. HARPER CO. • NATIONAL LOCK CO. • PARKER-KALON CORP.
PHEOLL MANUFACTURING CO. • ROCKFORD SCREW PRODUCTS CO. • SCOVILL MANUFACTURING CO.
SHAKEPROOF INC. • THE SOUTHINGTON HDWE. MFG. CO. • WALES-BEECH CORP.

THE FASTENERS OF TODAY . . . AND OF THE FUTURE

● **Corrosion resistant** ● **Extra strength**
● **Shiny smooth finish** ● **Uniform temper**

KEYSTONE'S GALVANIZED MB WIRE offers improved corrosion resistance . . . gives added life and strength to mechanical springs subject to rust and corrosive conditions.

This is due to Keystone's unique method of galvanizing the wire *before* it is cold-drawn. The drawing process smooths and hardens the galvanized finish, increasing its lasting qualities remarkably. Other advantages are its lustre-bright. shiny smooth finish . . . even, uniform temper . . . and high tensile strength.

Keystone is prepared to help solve any of your industrial wire problems. If special treatment is called for, Keystone's metallurgical research and testing facilities are available to supply the answers. We welcome your inquiry.

KEYSTONE
STEEL & WIRE CO.
SPECIAL ANALYSIS WIRE SETTING
NEW STANDARDS OF PERFORMANCE
PEORIA ILLINOIS

FERROALLOYS

Ferromanganese

78-82% Mn. maximum contract base price, gross ton, lump size.

F.o.b. Birmingham	$174
F.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont.	$172
F.o.b. Johnstown, Pa.	$174
F.o.b. Sheridan, Pa.	$172
F.o.b. Etna, Clairton, Pa.	$175

$2.00 for each 1% above 82% Mn, penalty, $2.15 for each 1% below 78%.

Briquets—Cents per pound of briquet, delivered, 66% contained Mn.

Carload, bulk	10.45
Ton lots	12.05

Spiegeleisen

Contract prices gross ton, lump, f.o.b.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Palmerton, Pa.	$64.00	$65.00
Pgh. or Chicago	65.00	66.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, packed	29.75
Ton lots	31.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	28
Ton lots	30
Less ton lots	32

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb. of contained Mn ..... 18.15¢

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, delivered.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	25.25	27.10	28.30
0.10% max. C	24.75	26.60	27.80
0.15% max. C	24.25	26.10	27.30
0.30% max. C	22.75	25.60	26.80
0.50% max. C	23.25	25.10	26.30
0.75% max. C, 7.00% max. Si	20.25	22.10	23.30

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.

Carload bulk	8.95
Ton lots	10.60
Briquet, contract basis carlots, bulk delivered, per lb of briquet	10.30
Ton lots	11.90

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $82.00 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $80.00. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

96% Si, 2% Fe	20.70
97% Si, 1% Fe	21.10

Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 1 lb Si briquets.

Carload, bulk	6.30
Ton lots	7.90

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.

25% Si	17.00	75% Si	13.50
50% Si	11.30	85% Si	14.65
90-95% Si			16.50

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Prices Continued on Page 144

If you use chain in your products . . .

ROUND will help you manufacture more economically... will boost your sales!

THE·OLDEST·NAME ROUND IN CHAIN

Regardless of the type of chain you use in manufacturing your products . . . whether it's Proof Coil, Super Steel or Conveyor, Double Jack or Safety, or any of a hundred other kinds of chain . . . *specify ROUND!*

Six large plants with warehouses in principal cities guarantee that your needs will be met promptly and efficiently. ROUND chain engineers will be glad to consult with you and to make recommendations that will cut your costs and speed up your assembly work.

Also—when you specify ROUND CHAIN, you secure an "extra bonus" which gives you a decided sales advantage in today's competitive markets. This bonus is public confidence in the ROUND name.

ROUND has stood for top quality in chain since 1869. Your customers know the ROUND name. Their customers, in turn, know and trust it.

Manufacturers, who feature the ROUND name on their products and include it in their advertising and sales promotion, agree that it is a real aid to sales.

You, too, can benefit by this prestige, born of over 80 years of fine chain craftsmanship. Specify ROUND on every chain order.

A-2881

Proof Coil or BBB Coil

Liberty Coil—Twist Link

Liberty Coil—Straight Link

Liberty Machine—Twist Link

Lock Weave or Triumph Pattern

Buckeye or Brown Pattern

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The Cleveland Chain & Mfg. Co.

Cleveland 5, Ohio

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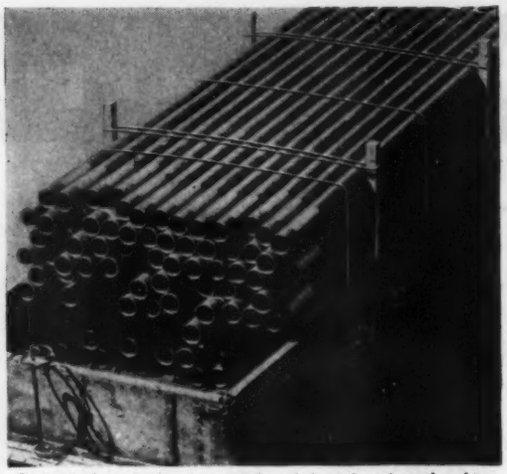
THAT MEANS GERRARD!



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MODEL HU68 universal joint type driller performing core drilling, reaming and facing operation on forged steel parts.

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MOLINE TOOL CO. HOLE-HOG MOLINE, ILLINOIS

Other Ferroalloys

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	7.65¢
Ton lots	9.05¢
Calcium molybdate, 45-40%, f.o.b. Langeloth, Pa., per pound contained Mo	96¢
Ferrocolumbium, 50-60%, 2 in x D, contract basis, delivered, per pound contained Cb.	
Ton lots	$3.50
Less ton lots	3.55
Ferro-Tantalum-columbium, 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta	$2.67
Ferromlybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo	$1.13
Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton	$65.00
10 tons to less carload	75.00
Ferrotitanium, 40%, regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti	$1.28
Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti	$1.40
Less ton lots	$1.45
Ferrotitanium, 15 to 19%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton	$167.00
Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W, 5 ton lots, delivered	$2.25
Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained V.	
Openhearth	$2.90
Crucible	3.00
High speed steel (Primos)	3.10
Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa.	95¢
bags, f.o.b. Washington, Pa., Langeloth, Pa.	94¢
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Carload, bulk, lump	11.00¢
Ton lots, bulk lump	11.50¢
Less ton lots, lump	12.25¢
Vanadium pentoxide, 88-92% V_2O_5 contract basis, per pound contained V_2O_5	$1.20
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Ton lots	21.00¢
Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.	
Carload, bulk	6.60¢

Boron Agents

Contract prices per lb of alloy, del.	
Borosil, f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B	$4.25
Bortam, f.o.b. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢
Carbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4.5-7.5% f.o.b. Suspension Bridge, N. Y., freight allowed.	
Ton lots, per pound	10.00¢
Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots	$1.20
F.o.b. Wash., Pa.; 100 lb, up	
10 to 14% B	.75
14 to 19% B	1.20
19% min. B	1.50
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.	
No. 1	93¢
No. 6	63¢
No. 79	45¢
Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, delivered.	
Ton lots	$1.46
Less ton lots	1.57
Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.	
Less ton lots	$1.80
Silcaz, contract basis, delivered.	
Ton lots	45.00¢

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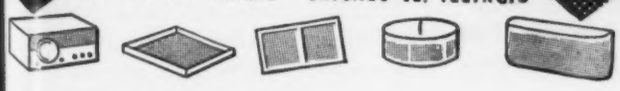

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14' Niles Pyramid Type Plate Bending Roll. Top Roll 18½", Bottom Rolls 14" Diameter. 25 H.P. Westinghouse 440/3/60 Main Drive Motor. 7½ H.P. Westinghouse Elevating Motor

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NEWS OF USED, REBUILT AND SURPLUS MACHINERY

Prices Leveling — The price spiral that hit the Chicago area 8 weeks ago is finally leveling off. Although prices have not fallen much since then, they are no longer continually rising. Steadying factors responsible for the leveling off are some buyer resistance to the skyrocketing prices and the subsiding wave of panic buying that followed in the wake of the Korean situation.

As usual, late type production and toolroom equipment are bringing high prices. Machines built during the 1930's are experiencing a fair activity. Equipment older than this is still slow to move and in good supply. Dealers are willing to sell them at a little above pre-Korean prices to move them.

Philadelphia Demand—The rush to buy any and all types of used equipment that could possibly be used for armament production has slowed here. War work has not yet come to the smaller subcontractors who use many second-hand tools. However, dealers concede that their business activity during the past 3 months has improved slightly.

The anticipated shortage of machine tools because of the Korean situation had caused many dealers to buy with the hope that prices would rise sharply in the near future. Now, most members of the trade do not anticipate any shortage in the Philadelphia area for many months.

Holding On—Many Philadelphia dealers, in a wait-and-see attitude toward the war's effects, are holding on to the machinery they would ordinarily dispose of. The government is selling no used machinery at all. For these reasons, dealers here are frequently making purchases from other dealers.

Prices and Profits—The recent buying and selling between dealers in the Philadelphia area has caused prices to rise on some items. Older and intermediate age machines are holding a fairly steady price level. The more modern types are rising slightly in price. Profits on most sales have been fairly constant. This because most machines, although sold at higher prices, were bought at higher costs.

Anti-Social Dealers—The situation has reached a point in the Cleveland area where dealers are refusing to do business with each other. That is, the prices they quote to each other are now net, not less 10 pct, or a resale discount. This has developed within the past 60 days. Some are even refusing to give another dealer an option for inspection.

Frustrated Buying Efforts—Some Cleveland dealers have gone so far as to put two or more men out on the road constantly trying to buy used machines. Results so far have been mediocre. Plant auctions and sales are still of little value to the dealer buying for stock. The major source remains for general jobbing shops. Here, changes in production create needs for different equipment and cause trading back and forth with dealers. A possible solution to the dilemma, and one which at least one major dealer is seriously considering, is the machine tool rental plan as described in: "You Can Rent It For Less," THE IRON AGE, Aug. 31, p. 51.

Machinery Catalog—New 32-p. pocket size catalog lists the stock of Miles guaranteed rebuilt machinery. Included are automatics, balancers, boring machines, broaches, buffers, compressors, drills, furnaces, gear machinery, grinders, hammers, honers, lapping machines, lathes, milling machines, planers, presses, riveters, shapers, slotters, tappers, upsetters, welders and others. *Miles Machinery Co.*

For free copy insert No. C-1 on postcard, p. 35.